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## ABDOMINAL PAIN AND THE INTEGRATION OF THE PATIENT.

By VICTOR J. KINSELLA,
*Sydney.*

IN his remarkable book, "Man, the Unknown", Alexis Carrel points out that man is so intricate in structure that the techniques of many sciences have been used in his analysis, and "according to our means of investigation, his activity appears to be physical, chemical, physiological or psychological". Man therefore takes on the appearance of being multiple, fragmentary aspects are considered as representing the whole, and we fail to apprehend him directly in his entirety. Each specialist confines himself to one part of the body or consciousness or of their relations with the environment. The enormous mass of scattered data which has resulted from their researches needs to be synthesized.

Carrel likens the body of man to a sea, in which the body cells are small organisms, either fixed or swimming free in their aerated nutritive medium.

All living cells depend absolutely on the medium in which they are immersed. They modify this medium unceasingly and are modified by it. Their structure and functions are entirely subordinated to the physical, physico-chemical, and chemical conditions of the surrounding fluid.

Cells and medium cannot be separated from one another. But to these physico-chemical and physiological concepts must be joined the psychological concepts characteristic of man.

An interesting illustration of the importance of the fluid medium is the recent theory of the chemical transmission of the nerve impulse at nerve endings and at ganglionic synapses. A normally subliminal concentration of the chemical transmitter may under abnormal conditions become supraliminal. Thus an accumulation may be brought about by repetitive stimulation. Further, its dispersal and destruction may be hindered or prevented by extrinsic factors; thus Lewis could prolong the

action of his histamine-like substance by arresting the circulation. The evidence for this theory is very strong, and physiologists are already looking forward to its extension to the neuronal junctions in the central nervous system. Feldberg states that the basal ganglia are rich in choline and cholinesterase.

Attempts to conceive man as a whole, the importance of the intercellular tissue fluids so well shown in tissue culture, and the theory of the chemical transmission of nerve impulses cannot fail to modify our conceptions of clinical problems and to help us with our difficulties.

### Parietal Anæsthesia and an "I.F. Substance".

One of the most interesting problems recently presented to the clinician is the fact that pain of visceral origin, with its associated tenderness and muscular rigidity, may be lessened or even abolished entirely by local anæsthesia of the parietal tissues.

The attempts made to explain this have been complicated and unconvincing. For example, in a recent article by Pollock and Loyal Davis[1] the suggestion is made that the painful stimulus from the viscus passes to the lateral columns of the spinal cord by sympathetic afferents and then by sympathetic efferents running antidromically in the posterior roots (or through the anterior roots by pre-ganglionic fibres to the sympathetic ganglion and then by post-ganglionic fibres) to the skin, where some hormonal or vasomotor process is set up, and sensory impulses then travel back to the spinal cord by the cerebro-spinal system. The local anæsthesia of the parieties thus blocks the nervous path from the viscus.

This hypothesis is difficult to accept, first, because there seems to be no purpose or sense in a pain impulse taking so circuitous a route. Secondly, parietal anæsthesia often fails to relieve referred pain, and there should be no failure if the pain impulse normally followed the route described. Thirdly, it has been shown that the parietal anæsthesia may be sufficiently effective to permit laparotomy and still pain may be produced by the stimulation of visceral afferents. Therefore it is more likely that the pathway for visceral pain is simple and direct, just as is the pathway for somatic pain.[2]

If the pain pathways are direct, it is necessary to formulate another hypothesis to explain the effects of parietal anæsthesia on visceral pain. The work which has been done by the physiologist upon the chemical transmission of the nerve impulse in the peripheral nervous system, and which has been briefly referred to, suggests that there may be set free a similar substance at the synaptic junctions in the spinal cord, and that this substance may be set free by stimuli reaching the cord (i) from the viscera, along the sympathetic nerves, (ii) from the parieties along the somatic cerebro-spinal nerves, and (iii) from the mind and the central nervous system along descending tracts. Let us postulate that the concentration of such a substance is normally subliminal, but that it may accumulate and become supraliminal through repetitive stimuli, and that in visceral disease it may diffuse from splanchnic to somatic synapses, thus producing the somatic accompaniments of visceral pain—rigidity and hyperæsthesia. In short, we have postulated a chemical or humoral basis for Mackenzie's "irritable focus" in the spinal cord. Let us therefore call our chemical transmitter in the cord an "I.F. substance". It provides a ready explanation for the effects of parietal anæsthesia, which cuts off some peripheral stimuli and thus leads to a decrease in the concentration of I.F. substance, so that a supraliminal concentration may become subliminal.

Moreover, if the I.F. substance can be set free by impulses in the descending tracts, it will provide a link between psychogenic and viscerogenic abdominal pain, and a ready explanation of the ease with which mental disturbance can cause pains indistinguishable from those of visceral disease. For example, it falls to the lot of most surgeons to remove an appendix with but slight signs of past inflammation from a patient who shows pronounced symptoms and signs of appendicitis. It appears that in these cases the patient has suffered pain through some transient organic change in the appendix (perhaps a twist, or the expulsion of a fæcolith or a mild inflammation) and that his attention and anxiety have been focused upon the right iliac fossa. Talks with his friends and stories of ruptured appendices, peritonitis and drainage tubes intensify his anxiety, his symptoms become more and more insistent, the surgeon finally removes the healed appendix and the symptoms disappear.

### The Essential Unity of the Peripheral Systems, Cerebro-Spinal and Autonomic.

During the course of operations under local anæsthesia it has been shown that the splanchnic nerves are sensitive to ordinary pain-producing stimuli. This sensitivity is constant when a large number of fibres can be simultaneously stimulated, as when the vessels of the mesentery are being ligated. Even in the viscus itself, where the fibres are sparsely scattered, pain may result from squeezing of the viscus when it is tense and inflamed.[2]

Further evidence of the sensitivity of the splanchnic nervous system is the relief given by presacral neurectomy from pains arising in the urinary bladder and the uterus and the rectum, and the success attending interruption of sympathetic pathways in some cases of *angina pectoris*.

Pain stimuli can be conducted also over the somatic parts of the autonomic nervous system. Every surgeon who operates under local anæsthesia quickly learns to appreciate the sensitivity of the periarterial plexuses, well illustrated in ligation of the superior thyreoid artery during thyreoidectomy. I have often demonstrated to my own satisfaction the sensitivity of the veins to slight distension when giving intravenous infusions through a funnel and tubing. If the tubing is sharply squeezed from above downwards, by the four fingers pressing against the thenar eminence of the operator's hand

in rapid succession from above downwards, the sudden increase in flow causes distension of the vein and sharp pain in the arm.

Somatic sympathetic pain was illustrated in the following case:

CASE I.—Mrs. H., aged forty years, was admitted to Saint Vincent's Hospital on October 29, 1938, suffering from trigeminal neuralgia. One week after resection of the sensory root it was decided, on account of changes in the anæsthetic eye, to fix the lids together. Flaps were lifted up from each lid, in width equal to about half the width of the eyelid, and sutured together, raw surface to raw surface, so as to leave a bridge of skin between the lids. The operation was carried out without anæsthesia. No pain was felt when the incisions were made, and the margins of the flaps were transfixed by retractor sutures. But when the flaps were dissected up, pain was felt as each tiny vessel was cut, and was felt again as it was grasped by mosquito forceps.

Many observers have noted pain in the head from stimulation of the cervical sympathetic (for example, Davis and Pollock, Foerster and his co-workers). But Frazier,[3] in reporting a number of cases of atypical neuralgia, found that sympathectomy gave no relief. Probably his cases were examples of psychogenic pain. At least one of the patients was finally cured by Christian Science, and one other developed a frank psychosis after her operation. Electric stimulation of various sympathetic fields produced varying results.

It is of interest to note that the nerves of blood vessels are found to terminate in free nerve endings, and also in encapsuled nerve endings of the type of Krause and Pacini, as though further to emphasize their unity with cerebro-spinal nerves, a unity which is obviously dependent upon the close anatomical connexion between the two systems.

Anatomists have found welcome help in their comprehension of the human nervous system by studying its history in the invertebrate and vertebrate stock. General inferences as to function, drawn from phylogenetic and embryological data, are permissible. One may therefore reasonably call to mind that the power to appreciate nociceptive influences and the power of movement are possessed by the lowest forms of animal life. These powers are of basic importance, fundamentals from a biological point of view, and necessary in the struggle for existence. In the unicellular animals they are possessed by a single cell. Higher in the animal scale (for example, *Hydra*) certain cells become specialized, receptor cells remain at the surface of the organism, effector cells sink inwards, and the two remain linked by a connector neurone. A neuromuscular mechanism is thus developed to undertake the duties of adjusting the creature to its environment and to provide for "fright and flight and fight". In the higher animals part of this nervous system subserves the vegetative functions (circulation, sweating, alimentation, excretion) and is uncontrolled by the will. A part of this vegetative nervous system becomes enclosed within the body cavities to take care of the primitive needs of existence, and loses its capacity for refined appreciation of environmental stimuli. But, however much the peripheral nervous system in man has become complicated (by division into autonomic and cerebro-spinal; autonomic into sympathetic and parasympathetic; sympathetic into splanchnic and somatic) it has still retained in all its parts its fundamental biological capacity of appreciating nociceptive stimuli. Naturally that part of the nervous system associated with the skin covering has retained the greatest efficiency in appreciating physical interference. But the deeper autonomic system, although buried in the body cavities, has not lost altogether the sensory side of its primal inborn reflexes. These are still useful in warning the individual of disease, even if not always efficient.

A study of embryology serves further to stress the indivisibility of the peripheral nervous system, for anatomists are now agreed that it streams outwards in all its parts, voluntary and involuntary alike, from the neural tube and neural crests, and its various parts retain their close anatomical connexion with each other and with their common central nervous system.

I have been at some pains to stress the unity of the nervous system because clinicians have tended to wander far from the broad biological conceptions which are as necessary for the comprehension of the visceral afferent mechanism as for an understanding of any other part of the nervous system.

The observation that the viscera are insensitive to cutting and burning, and the conception of the "adequate stimulus" (namely, that the visceral nervous system needed some special stimulus for its excitation) tended to sunder in the minds of clinicians and physiologists the cerebro-spinal from the autonomic systems, so far as sensibility is concerned. The adequate or special stimulus with which the sensory nervous network of the hollow muscular tube is concerned, is an alteration in the calibre of the tube or an alteration in the tension of its walls. But it is probable that if a network of cerebro-spinal nerves were arranged in tubular fashion they would respond to alterations in the state of filling of the tube, just as do the plexuses of Meissner and Auerbach. That the splanchnic nerves respond to a special adequate stimulus is not on account of any peculiar faculty of their own, but merely because they lie in a network in the walls of a hollow organ. Conversely, we find the autonomic nerves responding to the same mechanical stimuli which excite the somatic nerves. But they respond in a much duller way. The somatic nerves, by virtue of their external position, which places them in direct contact with their environment, have developed a much higher degree of sensitivity. In other words, the two nervous systems have divided forces, the one subserving relationships with the outer world and retaining a parietal position, the other withdrawing to the interior of the organism and subserving visceral affairs. In more primitive forms of life there is no such division between the two nervous systems, and when the one finally does withdraw into the interior of the organism in order

to subserve vegetative functions, it loses partly, but not altogether, its old capacity for responding to nociceptive external influences. The embryology and phylogeny of the two systems show that they are but specialized parts of the one mechanism. In view of their essential unity, it is not surprising to find that their reactions to external stimuli are comparable, differing in degree rather than in kind.

### The Central Nervous System and the Mind; Visceral Neuroses and the Essential Unity of the Patient; the Variability of Patients.

The more primitive spinal and subspinal reflexes merit the attention which they have been given in the past by Hilton, Head, Mackenzie, Morley, Lemaire and others; but we shall never be able fully to understand abdominal pain in man unless we can broaden our conceptions as far beyond them as man himself has progressed beyond the amphioxus stage of vertebrate evolution.

Although our knowledge of abdominal pain has become more detailed in the last thirty years, we have not broadened our outlook since John Hilton wrote nearly eighty years ago that "the muscular apparatus of the abdomen, its serous membrane, the skin over the muscles and the intestines themselves are thus (by their nerve supply) brought into harmonious associations". His diagram shows but an isolated segment of spinal cord. The higher levels have been cut off and have never since been replaced.

In the anatomical museum one may profitably contemplate a vertebrate series in which the central nervous system of the most primitive form is but a segmented nerve cord with little difference between the anterior and the posterior ends, gradually becoming larger at its anterior end and merging into forms with a brain which becomes larger, until in man the brain does not appear as a mere anterior enlargement of the segmental nervous system, but the segmental nervous system looks like a small appendage to the brain. The profound biological significance of this series provides a fascinating story as told by the anatomist and the physiologist. It has meant for man a wide mastery over his environment, such as has been approached by no other species. It has welded into an efficient functional unit the countless and complex subsidiary parts of man's self, and has enabled him to face harmoniously and effectively the ever-changing difficulties of his environment. It has provided an instrument for the mind, a seat for the intellect and its faculties, a refuge for the emotions, a correlate for behaviour. These glimpses of the immensity of man's heritage have been appreciated by the psychologist and by the experienced clinician. But the dominance of the mind has not been given its due weight by those schools of thought which have sought to place before us the mechanism of abdominal pain. Hilton's conceptions, Mackenzie's viscero-sensory reflexes and irritable focus, Head's study of herpes, Lennander's study of the parietal peritoneum, and Morley's peritoneal reflexes, have all tended to fix man as a decerebrate, or even a spinal animal. But man has passed far beyond this stage, and his brain and mind have assumed a position of dominating importance.

Professor Morley, in his very interesting book, confines his remarks on psychogenic pain to one small paragraph, in which he rules out a consideration of this aspect of the problem on account of its being an obscure question.[4] On the other hand, a true understanding of the clinical problems of abdominal pain, even when associated with an organic lesion, and a sound interpretation of experimental findings, cannot be achieved if the mind of man is neglected. It is important to acquire a broader outlook than a merely materialistic one, and to realize the impossibility of dividing man up into his component parts without destroying him and so invalidating any observations made upon his living reactions. This fact can, of course, be well illustrated from the everyday experience of medical practice. I shall describe two examples of a more experimental type.

CASE II.—Mr. H.M., aged forty years, underwent Trendelenburg's operation of ligating the internal saphenous vein, under local anæsthesia. He had a quarter of a grain of morphine one hour before operation. At the end of the operation a dressing was placed on the wound; the patient was quite awake, but the eyes were closed and the face calm. A spring towel clip was gently fastened so that it hung onto unanæsthetized skin on the outer part of the thigh. The patient did not complain and his expression did not change. The towel clip was then removed. The patient was asked how he felt, and he said: "Not badly." I then said: "Now, let me know if you feel anything." The towel clip was again fastened on gently near the first place. The patient grimaced, squirmed, moved his head and said: "My word, that hurts!"

CASE III.—A female patient, aged sixty years, had a femoral hernia. She was operated on at Saint Vincent's Hospital, under local anæsthesia. She had had one-sixth of a grain of morphine before the operation. A towel clip placed on the skin over the right hypochondrium made her stir slightly and talk of her gall-bladder. She soon settled down with the clip still on. The clip was then taken off. Then I looked over the screen and said: "Now, I want you to let me know if you feel this", and put on the towel clip in the same way about two inches away. She complained bitterly. When asked which was the worse pain she had no hesitation in saying: "The second."

The absence and insignificance of the responses in these cases to the first towel clip show the influence of morphine in dulling a painful stimulus, and the greater response to the second towel clip illustrates the influence of the fixing of the patient's attention in apprehension of some unknown, possibly painful, stimulus.

It cannot be too strongly stressed that the mind and its instrument, the central nervous system, and the peripheral nervous system act as a single physiological unit, the parts of which are functionally inseparable.

Consider, for example, the well-known influence of the mind in localizing a stimulus, the curious errors of judgement to which it can be subjected. Halliburton has made the following statement on the subject:

Thus, if the blunted points of a pair of compasses (maintained at a constant distance apart) are slowly drawn over the skin of the cheek towards the lips, it is almost

impossible to resist the conclusion that the distance between the points is gradually increasing. When they reach the lips they seem to be considerably further apart than on the cheek. Then, too, our estimate of the size of a cavity in a tooth is usually exaggerated when based upon sensations derived from the tongue alone. Another curious illusion is the following. If we close the eyes and place a marble between the crossed fore and middle fingers, we seem to be touching two marbles. This is due to an error of judgement. The marble is touched by two surfaces which, under the ordinary conditions, could only be touched by two separate marbles; hence, regardless of the fact that the fingers are crossed, the judgement is formed that the two sensations are due to two marbles.

An interesting example of how a mental error of judgement can influence and nullify the best efforts of our combined sensory mechanisms, including superficial and deep and visual sensibility, is illustrated by the following experiment.

Direct a friend to extend the arms straight forwards, forearms fully pronated, cross the wrists one over the other so that the palms face each other. The fingers are then interlocked, thumbs nearest the floor. The wrists and elbows are then flexed, the forearms being supinated so that the clasped hands rotate, the thumbs passing upwards in front of the chest, the interlocked fingers coming to lie uppermost. Certain ones of these fingers are pointed to by the experimenter, and the subject is asked to move the finger indicated. His effort usually results in the moving of another finger, probably one belonging to the other hand.

Passing to disease we observe comparable phenomena.

A patient of Dr. R. A. Money had a complete interruption of conduction in the spinal cord through an extradural tumour at the level of the third thoracic segment. After the removal of the tumour the cord showed some slight evidence of recovery of function. At this later stage a slight twitch upon the pubic hairs was sharply felt as a pain in the axilla and front part of the chest, at about the level of the second thoracic segment.

This is an example of allocheiria, first described by Head in *tabes dorsalis*, in which the brain refers a painful stimulus from an area of lesser sensibility to one of greater.

It is agreed that the pain caused by pressure upon a peptic ulcer is accurately localized to the position of the ulcer. Professor Morley quotes this "argument from localization" in support of his theory of parietal peritoneum origin of the tenderness.[4] But the peptic ulcer on the anterior wall of the duodenum, or the anterior aspect of the lesser curvature, or the anterior aspect of a posterior gastro-enterostomy stoma, may have no contact with the parietal peritoneum. Professor Morley fails to explain these cases and confesses his difficulty. But this difficulty would not have arisen if he had considered his patient as a whole and integrated him, body and mind, instead of slicing him up and leaving him a mere stack of metameres. The tenderness is well localized because the examining finger, when eliciting different points of tenderness, excites different skin areas, and each of these different skin areas has its own "local signature", and this is naturally associated by the mind with the tenderness.

Familiar examples of the influence of mind on visceral function is the loss of appetite associated with acute worry, and the familiar frequency of micturition and perhaps of bowel action (and sometimes even pallor and sweating) brought on by the stress of an examination, and the vomiting brought on by witnessing a serious accident. It is not uncommon to be told that pain has disappeared on visiting the doctor (or dentist). Soldiers wounded in battle and footballers injured on the playing field (even with broken bones) may feel no pain until the acute struggle is over. A severe pain may eclipse a less severe pain and even extinguish it, a fact which Professor Morley has beautifully illustrated in his study of shoulder-tip pain. It would be easy to multiply such instances.

The older clinicians stressed the fact that they treated patients rather than diseases. In this way they paid tribute to the influence of the mind and also to the variability of patients.

That patients vary greatly is a truth which applies to all parts of their being and which is of first importance in the study of abdominal pain. It applies to the mind as well as to the peripheral tissues and to the intervening nervous connexions. Patients vary not only in psychological type, but also in their response to similar peripheral stimuli.

Compare the different emotional effects of a discordant note in the musical and the unmusical; of a clash of colour in the artistic and the inartistic; the student who is deeply moved and the student who is apparently indifferent at an oral examination; the patient who is highly nervous and the patient who is quite calm when examined clinically. Familiar to the surgeon who operates under local anæsthesia is the patient who jumps when the sheeting is arranged, again when the iodine is applied and again at the touch of the hypodermic needle.

I can well remember an extremely highly strung and talkative young woman from whose back I removed a mole. In spite of meticulous local anæsthesia, she appeared to feel as a pain every step in the operation.

In one week I removed the appendix under local anæsthesia from two prize-fighters, both with premedication of bromide and chloral. In one the appendix was grossly thickened and almost indistinguishable from a brawny phlegmonous infiltration of its mesentery and of the posterior abdominal wall to which the appendix was fixed. In ordinary circumstances I should have completed this operation under general anæsthesia; but the patient's medical adviser had especially asked for a completion of the operation under local anæsthesia. The patient neither moved nor winced in spite of considerable pain.

In the second case there were no technical difficulties and the pain was inconsiderable; but the patient alternately wept at the memory of his long-dead wife and prayed fervently either for himself or for the steadiness of the operator's hand, and occasionally fortified himself by loud assertions of his courage.

There is a phlegmatic peasant type who comes stolidly to the theatre. Some of these subjects go through the operation with indifference; others, at the first touch of the iodine break out into a cold sweat and show signs of an agitation which soon rises to the pitch of blind unreasoning terror, uncontrollable either by the patient himself or by the operator. Again, among the highly strung and

"jumpy" young women there are some in whom a successful operative procedure is impossible without effective premedication or general anæsthesia, and others, at first sight unpromising material and admittedly "scared", who can be calmed by encouragement and explanation. One such patient became quite interested in the operative procedure and tried to guess at the instruments being used and the layers being sutured, and finally left the theatre quite triumphant and proud of herself.

Variation in the constitution and distribution of the peripheral nervous system is familiar to every student of anatomy.

Of great interest are the varying reactions to similar peripheral stimuli and to experimental or operative procedures—for example, to the touch of the iodine swab or to the prick of the hypodermic needle. The posterior parietal peritoneum in some patients is sensitive to painful stimuli; in other patients it is insensitive.[2] Although the anterior parietal peritoneum and the vascular part of the mesentery are always sensitive, a great difference in the degree of sensitivity in different patients is to be noted.

During one morning two Norwegian sailors had appendicectomy performed; the first suffered severe pain when the mesentery was clamped and no pain when the posterior parietal peritoneum was stimulated; the second had slight pain when the mesentary was clamped and great pain when the posterior parietal peritoneum was stimulated.

If hydrochloric acid is poured through a tube into the stomachs of patients with peptic ulcer, the results are quite variable. Discussing rhizotomy, Frazier refers to "a curious variability in the effects of dividing a given number of roots in any series of cases. In some one finds a partial, in others complete anæsthesia; in some it is transitory, in others permanent, and in others again there is hyperæsthesia.

Alvarez writes:[5]

In many cases, even when both the anterior and posterior spinal roots are cut, pain will continue to be felt in a region which is so completely anæsthetic that operations can be done in it without discomfort to the patient. Foerster has reported the case of a man who, even after a complete break in the continuity of the spinal cord, continued to suffer from pain in the legs and to feel something when they were pinched. In such a case the afferent pathway for peripheral pain, if such it was, must have been along the nerve plexus in the walls of the blood vessels.

The widely differing clinical pictures which may be produced by apparently similar lesions of abdominal viscera are a well-known source of interest and confusion for surgeons. There are chronic peptic ulcers which cause pain, and others which give no indication of their presence till they perforate or open into a blood vessel. Gall-stones may remain latent or cause severe symptoms. Biliary colic may be associated with great rigidity and tenderness, although more usually it is associated with little or none. Some women with acutely ruptured ectopic gestations, blanched and with a large amount of blood in the peritoneal cavity, may have a soft abdomen, others may have great rigidity; some may have a slow pulse rate, although most have a rapid pulse rate. Patients with appendicitis may present very varied clinical pictures, in spite of similarity in the type of inflammation and positon of the appendix.

One cannot help sympathizing with Professor Morley in his rejection of psychogenic pain from his discussion on abdominal pain, and one can agree with his remark as to its difficulties. But the subject can be simplified (and unified) by realizing that the mental sphere is the central dominating part of the individual, the mind being an instrument capable of receiving or rejecting pain-images transmitted from the periphery. On receiving them it may register them more or less intensely and interpret them in ways peculiar to different individuals, adding also the "emotional affects" peculiar to the individual. The mind may store the pain-image for a shorter or longer period, depending upon the sensitivity of the higher cerebral pain centres (cortex and thalamus), upon the intensity and duration of the original stimulus and upon the frequency of its repetition. Further, the mind may create its own pain-images, and these may serve as an escape or provide a means of flight from difficulty. These pain-images may be brought into prominence by adverse environmental conditions, by the conflict of instincts, by emotions (fear, anxiety *et cetera*), by fatigue, or by sickness or injury.

The effects of the higher centres acting through the sympathetic nervous system and the endocrines upon the viscera are so well known that they need only be mentioned. Recently Harvey Cushing[6] has added the hypothalamic region ("the interbrain") to the centres of immediate importance to the viscera.

Although all viscera are influenced by emotions, one organ may bear the brunt of the disturbance and a neurosis may thus be fixed to the heart, the stomach, the uterus or the kidney *et cetera*. Why any particular part should be picked out is sometimes explained by family weakness or personal inferiority in the organ (perhaps manifested by other evidences of abnormality—ptosis or retroversion of the uterus, vascular hypotension, achlorhydria *et cetera*). The dyspepsias of hypersthenic and asthenic types, and muco-membranous colitis are examples. Sometimes the organ picked out is determined by the experiences, organic or psychological, of earlier life. Sometimes it is actually the seat of real but comparatively minor organic change.

Patients whose pains are of psychogenic origin are familiar to all medical men, as the neurotic type continually reporting pain in different situations (over the heart, over the brain, over the lungs, over the stomach, over the uterus), nearly always over some viscus; the patient very often comes accompanied by sheafs of negative reports from the pathologist and bundles of normal radiographs. Some of these patients are cured, at least for a time, by reassurance and explanation, others by a

chiropractor's manipulations, and others by a lapse into Christian Science; but many of them spend a long lifetime successfully resisting the best efforts of the faculty and its camp followers.

The visceral symptoms arising from acute emotional disturbances have already been noted; and these are matters of everyday observation, cause and effect being clearly evident to everybody and not, as a rule, needing attention by a doctor. But the emotional cause may be more prolonged, less acute and less obvious; and the visceral disturbance may then tax the best efforts of the clinician. In many cases when the cause ceases to operate the patient gets well and the case becomes clear to all. The following examples are given.

CASE IV.—Mrs. M.E.K., aged sixty-two years, now in comfortable circumstances and well, except for an inflamed subacromial bursa, relates that her husband died when her five children were all under ten years of age. She had to work for the support of these children, and suffered indigestion and epigastric pain while she was responsible for them. When the last child was fairly launched upon the world her symptoms finally disappeared.

CASE V.—Miss X, aged twenty-three years, suffered from indigestion and epigastric pain, not relieved by food. Examination revealed no abnormality. Attention to diet and the administration of alkalis gave no relief. The patient practised intercourse with her *fiancé*. This gave rise to anxiety as to the consequences to herself and as to the difficulties which would arise if it were found out by her parents. The symptoms ceased when the practice was given up, recurred when it was resumed, and ceased again when it was again given up.

CASE VI.—Mr. R.B., aged twenty years, seen in January, 1933, complained of epigastric pain for eighteen months, inclined to occur one hour after meals, and accompanied by nausea. The pain was relieved by "powder" but not by food. Honey brought on the pain. He had had "indigestion" as a baby. Every few weeks he would get an attack of diarrhœa, especially if he took a glass of water after food. He smoked tobacco in moderate quantities. The appendix had been removed six years previously. Examination revealed tenderness above the umbilicus. An X ray picture showed that the tenderness was over the duodenum, but included also a diffuse area above the lesser curvature. There was some degree of dilatation of the duodenum, which might have been ileus. The duodenum was regular in outline. The patient's symptoms came on soon after he had left school. After leaving school he was not able to get work on account of the financial depression. He was told that he was physically sound and that his economic position had a good deal to do with his symptoms. Six months later he was much better, but had to avoid certain foods. He became quite well a few months later, when he got a job, and he has remained well ever since.

CASE VII.—Mr. A.J.S., aged forty years, also seen in January, 1933, complained of nagging epigastric pains of ten months' duration, sometimes very severe, worse when he was hungry or when he was walking, relieved partly by food, by the taking of soda or by vomiting. His appetite was poor and he could not even take tea readily. He had lost four stone in weight in ten months. Examination revealed pronounced tenderness over the whole of the epigastrium. The X ray picture showed a normal gall-bladder and an "irritable duodenum". Two weeks of Sippy treatment made no difference to his symptoms. It was ascertained that his symptoms had come on after he had lost his fish business during the financial depression. In March he regained a position in the fish business and went away for two weeks' holiday, during which time his symptoms disappeared and he gained fourteen pounds in weight. He is still working and quite well.

In another group of cases the emotional disturbance appears to be permanent, either because the adverse environmental conditions are unalterable or because the disturbance arises from within the patient's own ill-balanced ego. These cases are usually associated with headache and often with exhaustion, but sometimes abdominal pains are added. Two examples are appended:

CASE VIII.—Mrs. X., aged twenty-nine years, was first seen in July, 1936. This patient has severe pain in the right iliac fossa and pain in the left supraorbital region. These pains are continuous, although the patient usually complains about them one at a time. They have been present for at least six years, except for an interval of almost three months, including the time just before her marriage. The patient looks well nourished and not uncomfortable. She has been thoroughly investigated and treated at five large hospitals (in most of them several times) and has been under treatment by many private practitioners in the city and country without result. Investigation has run the full gamut of neurological methods, from an encephalogram to trial injections of vitamin *B*. Ophthalmologists have ordered glasses; rhinologists have performed many endonasal operations; she has been treated by cocaine sticks in the nose, by medicine and by tablets; psychiatrists have done their best; she has had massage, "electric treatment", gastric lavage, blisters, isolation, forced feeding and later starvation and removal of the right ovary and of the appendix. During these years the patient has been given many hypodermic injections of morphine, very often with no effect. My own contribution was the cutting short of a severe attack of the frontal pain by a "Novocain" block of the supraorbital nerve far back in the orbit, and this encouraged me to explore the nerve and avulse it from a supraorbital osseous canal. The pain persisted. The patient was then treated by a physician by infra-red radiation, removal of the tonsils, electro-coagulation of the cervix and a "Protocain" injection of the broad ligament. Still the pain persisted, and the physician in desperation sent her back, suggesting an operative exploration of the pelvis. But this had been carried out five years earlier. I thought that the extreme abdominal tenderness disappeared during very brief and fleeting moments, and pelvic examination under anæsthesia revealed no abnormality. At one stage the patient complained of a swelling in the left frontal region and of an offensive smell from this swelling, noticed by her husband. Examination revealed an acneiform eruption confined by the middle line to the left side of the forehead.

After observing this patient for two two years I have become convinced that her pain is of psychogenic origin. At the age of seventeen years she had a child by Mr. A., and this child is now under the care of the mother of the patient. Ten years later she married Mr. X., but Mr. A. still met the financial burden of his child. This was important, because Mr. and Mrs. X. are in poor circumstances. Mr. X. knew of the child. One very severe paroxysm of pain came on after the receipt of a long-feared letter from Mr. A., stating that no more financial help would be forthcoming for the support of the child, now twelve years of age.

CASE IX.—Mrs. Y., whom I have observed for the last fifteen years, is a lady, aged sixty-six years, who for very many years has had pain in the face and head and also in the back and abdomen. The pain in the head is associated with "antrum and sinus trouble", "adhesions" in the nose, and "Eustachian blockage". It has been under continuous treatment by different nose specialists; but the intranasal manipulations, however skilled and gentle, are not found to give relief unless carried out by a specialist who is also a practical psychologist and able to sympathize deeply and exclaim upon the dreadful state of the nose. There has never been any blockage or crusting or discharge or deafness. The abdominal pains and discomforts are associated with a movable kidney and can be relieved by a special corset, unless the kidney

"slips", and then rest and seclusion are necessary. The chief factors which determine the onset of pain, either in the head or in the abdomen, are, first, domestic difficulties, either with members of the family or with the staff, and secondly, a necessity for meeting people either in the home or in some social gathering elsewhere. The patient comes of artistic, temperamental stock, her domestic environment is difficult, she feels an intellectual inferiority when conversing with strangers, either with her social equals or even with those who by all the canons of provincial society should be her inferiors. But she can find refuge from these undesirable encounters when the kidney slips, and, moreover, she can always plead the tightness in the head which is either just about to be relieved by the periodical visit to the specialist or has just been aggravated by the intranasal manipulations of the same gentleman.

Note the frequent association of abdominal pain in the neuropathic individual with symptoms elsewhere, especially the head.

In a third clinical group of great interest the mind and the higher cerebral centres perpetuate the pain of an organic lesion. These cases provide the pathological counterpart of a story told by C. W. Crile and W. E. Lower, in their book on anoci-association, of a physician who had a pistol pressed into his back by the trembling hand of a nervous burglar who ransacked desk and pockets with the other hand. The physician was in terror lest the pistol should be discharged, and for months he felt in his back the actual sensation of the pressure from the pistol, "as real a sensation as if the pistol were actually there". This perpetuation of the sensory image appears to depend upon the intensity of the original stimulus, its duration, its frequency of repetition, and the degree of fear or anxiety with which it was associated and also upon the mental constitution of the individual. A good example, frequently met with and already quoted, is the patient who has recurrent attacks of appendicitis. He fears an acute attack or that the appendix will burst suddenly, for he has heard of such cases. Weeks and even months after the last attack there may be considerable tenderness over the appendix, and yet at operation the appendix looks almost normal, showing perhaps the slight marks of previous attacks (a scar in the mucosa, a peritoneal adhesion, a small fæcolith, a slight irregularity in the thickness *et cetera*), so slight that the operator fears that his work may be misdirected. But time justifies the operation and the pain and tenderness disappear.

CASE X.—Miss P.S., aged twenty-two years, first seen in March, 1938, had severe hæmatemesis. She gave a history of ulcer pains, and X ray examination revealed a duodenal ulcer. Thorough medical treatment brought about a healing of the ulcer and disappearance of the ulcer pains. After leaving the hospital she began to have pain in the right iliac fossa and occasionally in the umbilical region. She was very tender over the appendix, and repeated observation revealed a persistence of this tenderness. The epigastric symptoms did not return. The patient was advised to have the appendix removed, and the possible causal relationship with her duodenal ulcer (and therefore hæmatemesis) was discussed. At the time of operation (performed under local anæsthesia) the patient showed considerable tenderness over the appendix. Operation was carried out two weeks after the last attack and showed very little change from normal in the appendix. Now, five months after the removal of the appendix, the patient is free from symptoms and signs.

The pronounced tenderness can best be explained by the patient's anxieties, not only on account of the appendiceal attacks, but on account of the possibility of an inflamed appendix causing a duodenal lesion.

In certain circumstances the pain may persist for a long time after the organic cause has been removed and occasion much anxiety to the patient and the operator.

CASE XI.—Miss H.T., a typist, aged twenty-four years, consulted me in March, 1936, on account of an epigastric pain, which had been present for three months and continuous during the previous few days. It tended to come on at irregular intervals after meals, especially after scones or doughy food. It was worse during the week and better at week-ends; worse on sitting still, better on moving about; worse on worry. Clinical examination revealed no abnormality, although it was thought that the patient was of the quiet, repressed type. She was reassured and given a sedative mixture with bismuth—treated as a "nervous dyspeptic". Her condition improved slightly and then she went away for three weeks' holiday to the country. After this she felt much better, but still had her epigastric pains. Radiological examination at this stage revealed a normal gall-bladder, a normal chest, and no abnormality in the upper portion of the alimentary tract. It was thought that there might have been a small hidden ulcer on the posterior wall, so the patient was put to bed and subjected to Sippy's treatment. This made no difference to the symptoms, and the diagnosis of "nervous dyspepsia" again held sway. The pain was most pronounced at the apex of the epigastrium, so a blister was applied to this area. In this way the pain was chased around the epigastrium with blisters (four in all) until it disappeared. The patient was now sent for another holiday, to the seaside this time, to complete the "cure".

Half-way through her holiday she got severe abdominal pains, which settled in the right iliac fossa. I found her very tender over the appendix. She had shown no signs of tenderness in this situation at any of her many clinical examinations during the preceding four months. The appendix was removed and found to be very injected, thick and stiff, and contained two large fæcoliths. Although this seemed to be so clearly the cause of her symptoms, they were only slightly better one month after the operation.

The patient then went to a very wise and experienced physician, who reassured her, saying that undoubtedly the appendix was the cause of the trouble and that only a little more time and patience were needed, when the symptoms would go. In another two months the symptoms had entirely disappeared, and the patient has been quite well during the last eighteen months.

It is clear that the epigastric symptoms were due to transient obstruction of the appendix by the fæcoliths, and that in the severe attack inflammation followed the obstruction. But the pain remained after the appendicectomy because it had become firmly fixed in a sensitive mind during a long illness, by the many treatments, by the grave suspicions entertained for months about the epigastric region, and by the scars of the blisters still present.

This persistence of the pain-image in the higher cerebral and mental spheres is a phenomenon well recognized by the neuro-surgeon (and perhaps better still by the psychiatrist) experienced in the treatment of headache. Dr. D. W. H. Arnott has told

me of patients of manic-depressive type (sensitive, artistic, talented) who have had neuralgia of dental origin, neglected too long, unrelieved by local treatment, unrelieved by alcohol block, unrelieved by sensory root section and finally leading in some cases to suicide. Frazier reports a series of cases of neuralgia, diagnosed at first as trigeminal neuralgia, in which sensory root section and later sympathectomy were carried out without effect. Probably this pain was psychogenic.

The cases described in this section are but commonplace to the psychiatrist; but I have presented them in some detail because they illustrate a point of view which has been neglected (although it is just as important as the surgical point of view) in attempts to understand the mechanism of abdominal pain.

### Conclusion: The Integration of the Patient.

Clinical and experimental experience shows that the parts concerned in pain production, pain conduction and pain perception function as a single instrument. All the levels of the mind, the central nervous system, the peripheral tissues, the viscera and the connecting neurones, illustrated diagrammatically in Figure I, are inseparable physiologically and must be looked upon as a single unitary entity. The connecting link between the cells is the ground substance or matrix in which they lie—the tissue fluids. Recent physiological research has strongly suggested the chemical transmission of the nervous impulse at synapses and at nerve endings. It is helpful to postulate the liberation of such a substance at neuronal junctions in the spinal cord; this would provide a humoral basis for Mackenzie's irritable focus in the cord, and would afford a possible explanation not only for the clinical phenomena described by Mackenzie, but also for the more recent observations on the abolition of visceral pain by parietal anæsthesia.

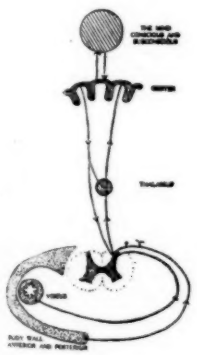

FIGURE I.

The visceral sensory mechanism. This should be conceived as a whole and not fragmented. The mind has been largely neglected in the explanations of mechanism. The visceral afferent neurone has been denied its proper place as a direct conductor of visceral pain and tenderness. (In the diagram the layers of the abdominal wall, with their motor and sensory neurones, have been represented as one for the sake of clearness.)

A separation of these parts brings about the dissolution of the individual, and the man ceases to exist. There can then be no longer any pain as we know it and as we wish to study it.

In like manner the psychogenic pains or neuroses should not be sharply separated (as by Professor Morley) from the pains of organic origin, and both types must be considered together if we are to understand either. They are inextricably mingled.

At one end of the scale is what appears to be pain of purely organic origin (for example, in acute appendicitis or when the towel clip is placed on the skin or when the soldier is wounded in battle); but we cannot fail to recognize that this is profoundly influenced by the patient's nervous and mental make-up, and by different external conditions disturbing the stream of consciousness and bringing the affected part more or less into the focus or full glare of emotional attention.

At the other end of the scale is what appears to be pure visceral neurosis, in which the symptoms seem to depend upon a mental stress—anxiety, fear or some emotional conflict. But even in these cases there is probably some "organ inferiority".

In between we find the mixed case, in which an actual neurosis has become grafted upon an organic lesion, and even after cure or removal of the latter the pain-memories persist for a varying length of time.

It is clear that the emotions and the higher centres can inhibit pain, that they can perpetuate the pain of an organic lesion, and that they can originate pain of their own. (Emotional or psychic pain is clinically peculiar, in that its response to the analgesic drugs, even to morphine, is disappointing. Morphine appears to act best when the cause of the pain is located in the more primitive visceral division of the nervous system.)

The comprehensive grasp of the individual, his sensory apparatus from the higher mental levels right down to and beyond his ultimate nerve endings being looked upon as a single instrument, the parts of which are indivisible from each other and from every other cell which floats with them, in a common continuum (so that the higher and the lower levels exert a mutual influence one upon the other), is a conception which will not only help us to understand the experimental findings, such as the effects of parietal anæsthesia, but, most important of all, one which will help us to grasp and include within a common philosophy the multitudinous clinical aspects of pain in all its forms, ranging from the so-called "organic" to the so-called "functional", both in the splanchnic and in the somatic field.

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# MODERN CLINICAL METHODS TO COMBAT WHOOPING COUGH INFECTION.[1]

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WHOOPING COUGH is a serious disease of infancy and early childhood in Australia. In spite of extensive clinical and laboratory research during the last few years, there are still many problems, both in the prevention of infection in susceptible children and in the actual treatment of the disease. It is proved beyond doubt that whooping cough is due to infection with *Hæmophilus pertussis* (the Bordet-Gengou bacillus). It is also proved that the immunization of children with sufficient dosage of a vaccine prepared from virulent pertussis organisms (Phase I vaccines) protects the majority of children against infection (Sauer,[1] J. J. Miller,[2] Kendrick[3]). There is some evidence that specific serum therapy may be helpful in the treatment of the disease, particularly in babies, among whom the mortality rate is comparatively high.

More information is required on the following points: How long does the immunity conferred by vaccination last? Should children be revaccinated at intervals after primary immunization? Is it necessary to immunize all children who do not give a clear history of clinical whooping cough, or are some of these really immune as a result of mild undetected infections? If there are such unrecognized immune children, is it possible to detect them by a skin test resembling the Schick and Dick tests for immunity to diphtheria and scarlet fever? What type of vaccine and dosage scheme should be employed to give the maximum immunity with the minimum unpleasant reactions in the child? What is the best method of diagnosing whooping cough in the early stages, prior to the appearance of the "whoop", so that infected children may be isolated from their susceptible companions? Is serum effective in treatment of the disease in young children? If so, what is the best type of serum to use and in what dosage should it be given?

In the past three years an attempt has been made to gain some information on these matters. As it is probable that this necessarily protracted investigation will be interrupted by the war, the progress findings are here reported, although finality has not been reached on any of the points.

The work here described was planned as a clinical investigation; but I have had the advantage of close cooperation with workers at the Walter and Eliza Hall Institute and at the Commonwealth Serum Laboratories.

## The Skin Test.

Conflicting reports of the value of the skin test are obtained from the literature, a good summary of which is cited in a paper by A. R. Thompson,[4] who states that by the use of an extracted endotoxin for the test reliable reactions are obtained, but that whole undiluted vaccines give variable results. In my hands a suitably diluted vaccine gave results apparently comparable with those of Thompson.

### *Technique.*

An injection of 0·1 cubic centimetre of vaccine was given intradermally into the volar surface of the forearm. In the earlier tests a control solution of normal saline solution and antiseptic was also injected, and as no reaction took place from that, control injections were discontinued.

The first vaccine used was prepared at the Walter and Eliza Hall Institute. It was prepared from freshly isolated strains of *Hæmophilus pertussis* grown on agar containing human blood. The organisms were removed from the medium by a platinum loop and suspended in normal saline solution. The antiseptic used was 0·05% formaldehyde and 0·01% merthiolate, and the concentration of organisms was 2,000 million per cubic centimetre. Later, vaccines were prepared at the Commonwealth Serum Laboratories, and various strengths were tried to determine which gave the most consistent results; it was found that a strength of 1,000 million organisms per cubic centimetre was the best. Few positive reactions were obtained with the more dilute suspensions, whilst stronger suspensions, including various commercial vaccines, when undiluted, produced a non-specific inflammatory response regardless of the immune state of the patient. When diluted to a strength of 1,000 million organisms per cubic centimetre, all vaccines gave comparable results.

The first hundred tests were read every four hours for the first twenty-four hours, then again at forty-eight hours after the injection. A positive reaction developed approximately sixteen hours after the injection, remaining for eight to twelve hours, fading, to disappear forty-eight hours after injection, leaving a pigmented area in the skin. A positive reaction consisted of an area of erythema at least one centimetre in diameter surrounding the site of injection.

### *Results.*

Of 144 patients suffering from whooping cough, diagnosed on clinical evidence, 115 (80·0%) gave positive reactions to the skin tests when first tested. Of the 29 children who did not react to the first test, 11 (7·9%) gave a positive response on being retested three weeks later. The remaining 18 children did not attend for a second test. These findings suggest that response to the test becomes positive during the progress of the disease. It is not known whether any of these children would have given a positive reaction prior to the onset of the disease. These children were not suffering from very severe whooping cough, but were ambulatory patients seen at an out-patient clinic. Twelve children in hospital who were suffering from severe attacks—the duration ranging from four to thirteen weeks—

[1] This work has been made possible through the generosity of certain private individuals and by a grant of financial assistance from the National Health and Medical Research Council.

gave no reactions. An opportunity did not arise of testing these children during or after convalescence. Probably the reaction would have become positive, but further evidence is needed on this point. Skin tests were performed on 81 children attending the Children's Hospital for treatment for various diseases (other than pertussis). Twenty-nine of those children had had whooping cough, according to the histories elicited from the mothers. Ten of these children gave reactions and 19 did not. Of 52 children whose mothers stated that they had not had whooping cough, 47 gave no reaction and five gave positive reactions. There is a statistically significant correlation in this group between a history of clinical whooping cough and a positive response to the skin test. The correlation is not absolute, since five children with no history of whooping cough gave a positive response.

It seems justifiable to assume that these children had suffered from a mild undiagnosed attack of pertussis, since such attacks undoubtedly occur and can be diagnosed only by bacteriological methods. In respect of the 19 children with histories of pertussis who did not react to the skin test, there are two possibilities, not mutually exclusive: first, some or all of these children may not have had whooping cough, since the diagnosis cannot be proved except by isolation of the specific organisms, and the mother's statement may not in any case have been completely reliable. On the other hand, it is not unlikely that the response to the test may change from "positive" to "negative" in a proportion of children within a few months or years after recovery.

It is obvious that more evidence is needed on the following points: Are children who react to the skin tests, but give no history of whooping cough, immune or susceptible? Does an absence of reaction in a child with severe whooping cough change to a positive reaction during convalescence? Does the reactive power of the serum acquired as a result of a clinical attack of whooping cough persist throughout life, and, if not, how long is it on the average before the serum loses the power to react.

In the present state of knowledge it is probably safest to immunize all children who have no history of clinical whooping cough. The reactors to the skin test among such children are comparatively few (5 of 47 in this series), and it is not certain that they are immune. Further, the reactions following vaccination are no more severe than usual in those children reacting to the skin tests.

Another point worthy of mention is that there was no correlation between the response to the skin test of a number of mothers and their newborn infants, tested at the Women's Hospital, Melbourne.

### Active Immunization.

As indicated above, many authorities believe that Phase I pertussis vaccine, when injected in large doses, will protect an infant against whooping cough, and at the Children's Hospital an investigation has been carried out to assess the value of these measures in the control of whooping cough.

The following are the requirements for a vaccine: (i) it must be sufficiently antigenic to confer a lasting immunity on the infant when it is given in practical doses; (ii) in the doses necessary it must not cause severe general or local reactions.

The present view is that a total dose of at least 80 billion organisms is necessary to obtain adequate protection. The administration of that quantity of vaccine in the smallest number of injections without causing severe reactions has been the aim in this section of the inquiry.

The vaccine first described for the skin tests was found to cause a red wheal at the site of injection, and signs of general toxicity when a dose of more than 2,000 million organisms was given, so that a total dose of 25,000 million organisms appeared to be the largest practical total amount that could be injected.

With the cooperation and assistance of the Director of the Commonwealth Serum Laboratories, a supply of Phase I vaccine containing 10,000 million organisms per cubic centimetre was made available, and tests of reactions with different doses were carried out.

By gradually increasing the initial and subsequent dosages in different groups of infants it is now found possible to give an initial dose of 7,500 million organisms and four subsequent injections of 20,000 million at weekly intervals. The injection is made into the deltoid muscle, on the outer aspect of the arm, and the doses, except the first, should be divided, one cubic centimetre of vaccine being injected into each arm.

It must be realized, however, that about 10% of children develop a tender erythematous area at the site of injection, and exhibit anorexia and a rise in temperature up to 101° F. some four hours after the injection and lasting approximately eight hours. An attempt to avoid these reactions has been made by using vaccine that was washed ten times in preparation, and in one batch used the organisms were killed by heat. Different antiseptics were also used, but in the necessary dosage all Phase I vaccine gives much the same proportion of reactions. On personal inquiry amongst the authorities on pertussis in the United States of America it was found that they too observe that much the same proportion of children have reactions. It is to be hoped that some means will be discovered for preventing these reactions. Although they are not at all dangerous, they are disturbing to infants and parents; but they are small in comparison with the dangers to the infant and the anxiety of the parents if an infant develops whooping cough.

Some infants and children have tolerated larger doses than those mentioned above, and about 30% of infants were given two final doses of 30,000 million organisms to replace three injections of 20,000 each without severe reaction.

The most important question is: Have these infants who have received injections been protected

against whooping cough? For the 250 infants injected in Melbourne that question cannot be answered yet, for at the time of writing there has been no epidemic of pertussis in Melbourne by which the immunity of these children could be tested.

The recent records of J. J. Miller, junior,[2] and of Pearl Kendrick,[3] and the original investigation by Sauer,[1] however, show that at least 80% of infants who are immunized by a Phase I vaccine in large doses, are protected against the disease. How long the immunity lasts and whether it is advisable to give a further dose of vaccine one year after the first injections are points still under debate. Until we have a certain method of testing a child's immunity, comparable perhaps with the Schick test for diphtheria, the control of dosage in pertussis will be difficult. The serum of some of these children has been shown to contain antibody capable of protecting mice against infection with *Hæmophilus pertussis* (North,[5] Keogh, Anderson and Williams). These specimens of serum were tested from six to nine months after the completion of immunization. It is hoped to retest the same children after a longer interval.

### Passive Immunization.

The dangers of whooping cough, especially to young infants, are well known, and any measures that will ameliorate the severity and shorten the course of the disease are worthy of consideration.

Many investigators have used convalescent and adult serum for treatment of whooping cough in the early stages, and a comprehensive survey of the literature on this subject is given in the paper by Bradford.[6]

A ready source of possible antibody was found to be the parents' blood, and for the treatment of a group of infants at the Children's Hospital, Melbourne, 30 cubic centimetres of slightly citrated whole blood were injected into the buttocks. That is a large dose for a small child, and usually it was necessary to inject 15 cubic centimetres into each buttock. Unfortunately it is a somewhat painful procedure for the child; but the injected blood is apparently absorbed in twelve hours and no untoward reactions occur. Were convalescent serum of high antibody content available, the dose could be greatly reduced.

During the period of three months while this work was carried out, 15 infants under the age of two years were treated; 42 other children of similar age attending the clinic were regarded as controls. There was no selection of cases for blood injection, but for various reasons the control series is larger.

To estimate the severity of the disease, the infants were brought weekly to the hospital and examined for the development of complications. The parents were given a whooping cough record card on which to keep an account of the number of paroxysms and the frequency of vomiting. From the information on the cards and from clinical examination the cases were graded as "mild", "moderately severe", "bronchopneumonia".

The results are shown in Table I.

TABLE I.

| Grade of Illness. | Fifteen Infants receiving 30 cubic centimetres of Parents' Blood. | Forty-two Controls. |
|---|---|---|
| Mild ..... | 13 | 20 |
| Severe ..... | 2 | 18 |
| Broncho-pneumonia . | — | 4 |

More recently, serum collected from adult contacts during the last epidemic has given encouraging results in mouse experiments, and it is hoped that by the use of a suitable human serum a satisfactory method for the treatment of whooping cough in the early stages will be available.

To be successful in lessening the effect of the disease, serum requires to be injected soon after contact or when the early symptoms are present, and for that reason and for other reasons indicated above, an early diagnosis is essential.

### The Early Diagnosis of Whooping Cough.

A history of contact with a definite case of pertussis is the best aid to diagnosis, for it is well known that the coryza, slight cough and presence of a few moist sounds on auscultation of the chest found in the first week of whooping cough are not specific to that disease. The paroxysmal cough which develops next, if observed by the doctor, perhaps with the aid of gentle agitation over the trachea or the inhalation by the patient of a little cigarette smoke, may help in the diagnosis. However, that sign too is not specific to whooping cough, for one frequently finds that children suffering from streptococcal or other infections of the respiratory tract will have a paroxysmal cough and will even vomit. The presence of a whoop is diagnostic; but by that time the disease has been present for approximately ten days and much valuable time for serum therapy or isolation of the patient has been lost.

By means of the cough-plate, inoculated by holding the plate containing Bordet-Gengou media four inches in front of the child's mouth during a spasm of coughing, often encouraged by gentle massage over the trachea, by examination of the throat with a spatula, or perhaps best of all, by puffing a little cigarette smoke on the child's face, it is possible to identify the Bordet-Gengou bacilli colonies on the media after forty-eight hours' incubation. This identification of the pertussis colonies requires some experience of their particular appearance.

A positive cough-plate finding and the presence of a whoop are the only certain means of diagnosing whooping cough, and the former method is the only method available in the early stage of the disease.

### Summary.

1. The Bordet-Gengou bacillus is the causative organism in whooping cough infections, and vaccination with Phase I vaccine is of value in protection against the disease.

2. The length of time immunity lasts after vaccination, the dosage required for complete protection, the value of the skin test in estimating immunity and the value of serum therapy in treatment of the disease are subjects open to discussion.

3. By the use of a vaccine containing 1,000 million organisms per cubic centimetre for intradermal skin test, it has been shown that a positive response to the test develops during the course of the disease, and there is a correlation between a history of whooping cough and a positive response to the skin test.

4. Two hundred and fifty infants have been inoculated with Phase I vaccine, 80 billion organisms in divided doses being given. Approximately 10% had a troublesome but not dangerous reaction to the injections.

5. A clinical trial in fifteen cases indicates that human whole blood in a dose of 30 cubic centimetres given intramuscularly will ameliorate the severe symptoms of whooping cough.

6. By means of mouse experiments it has been shown that certain types of human serum from contacts are worthy of clinical trial.

7. The cough-plate is a valuable aid to the diagnosis of whooping cough.



### Acknowledgements.

During the course of this investigation I have had considerable assistance from the Director and staff of the Walter and Eliza Hall Institute and from the Director and staff of the Commonwealth Serum Laboratories. The cooperation of the medical staff of the Children's Hospital and of the medical officers of certain babies' homes has also been much appreciated. In the preparation of the paper I have been helped by Major E. V. Keogh.


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## TRICHOMONAS VAGINALIS VAGINITIS AND MONILIAL VAGINITIS: THEIR DIAGNOSIS AND TREATMENT.


By R. FRANCIS MATTERS, M.S., M.D., F.R.C.S.E., F.R.A.C.S., M.R.C.O.G,

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### Monilia Albicans Vaginitis.

A DECADE or so ago very little was written of *Trichomonas vaginalis* vaginitis and few references were obtainable. One of the first to draw attention to this protozoon in this country was E. A. Woodward. The author of the present article soon afterwards published an article concerning the irritant results of the trichomonad. The same type of obscurity as that concerning *Trichomonas vaginalis* vaginitis at that time is now associated with the infection of the vagina by a mould named *Monilia albicans*. This same fungus is sometimes found in the mouths of infants. It is also quite a nuisance in vines and rubber trees in hot moist climates. In these connexions it is called *Oidium albicans*.

The cases in which the author has met the *Monilia albicans* have been mainly among pregnant women, and the infection has caused vaginal burning and pain. One patient (incidentally the wife of a doctor) had such irritation of the vagina that a profuse discharge resulted and caused denudation of the epithelium on the medial aspect of the thighs.

In non-pregnant women it has been found that this vaginitis is found in cases in which vaginal lacerations have resulted in gaping vulvæ and prolapse of the vaginal walls.

#### *Diagnosis.*

With the patient in the lithotomy position the vagina is inspected with a bivalve speculum, lubricated with sterile jelly. The fungus is found in necrotic white patches which are on the vaginal wall or *portio vaginæ cervicis*, and it may be examined by means of a dressed probe. The dressed end is swabbed over the patches; it is then transferred to a test tube containing three or four cubic centimetres of normal saline solution and is stirred into the solution. The test tube is then agitated and a drop of the material is taken and placed on a slide. The specimen is next examined under the high power of a microscope. The diagnosis is established if yeast buds and mycelia are detected. The organisms are oval and measure about five to six microns in length. Incubation on Sabouraud's agar slope may be used to confirm the diagnosis.

These patients have a fairly profuse discharge, which has a somewhat pungent odour. Where it comes in contact with the skin after leaving the vulva it produces considerable irritation, which may be in the nature of a local dermatitis, and small pustules may form on the inner aspect of the thighs where the fungus has invaded the subcutaneous tissue. Crusts sometimes form, and they cause a loss of elasticity of the skin. The pruritus and

burning may be so severe as to prevent sleep and so to produce considerable apprehension regarding the expected labour; and in women with prolapsed vaginal walls, especially those past the menopause, there is a fear of cancer.

*Treatment.*

Several methods of treatment have been adopted in the cases under review. In all cases the vagina is swabbed with hydrogen peroxide and then with a dry swab. If this is not sufficient to dislodge the patches, a weak solution of *Liquor Potassæ* has been used; this is followed by swabbing with dilute peroxide of hydrogen solution and drying, as mentioned previously.

The first patients were treated with 5% silver nitrate solution, and the vagina was afterwards packed with a tampon of "Neo-Silvol". This treatment was a little trying to the patient, although successful. The next patients were treated with Bonney's blue paint after the preliminary cleaning; but its colour and subsequent distribution on the clothes are not accorded full appreciation by the patient, although it appeared to stop the infection. Finally, the silver picrate powder of John Wyeth and Brother was used with the Shelanski insufflator, as mentioned (*vide infra*) in connexion with the treatment of *Trichomonas vaginalis* vaginitis, except that in the treatment of moniliasis the silver picrate in kaolin was insufflated daily for three days, and this cleared up the condition in the cases under review. This treatment has subsequently been recorded by Shelanski and Kern; but they preferred to paint the area with a 1% silver picrate solution, because they felt that the insufflation was rather drying.

**Trichomonas Vaginalis Vaginitis.**

The ætiology, signs and symptoms of *Trichomonas vaginalis* vaginitis have been described so frequently that it would be redundant to recount them here. The diagnosis is made in the manner described for the detection of *Monilia albicans*, except that warm saline solution on the slide enables the trichomonads to be observed moving rapidly across the field.

*Treatment.*

The vagina is cleansed with hydrogen peroxide and it is then dried. It has been found more recently that an excellent method of cleansing is by means of "Kaomagma" (Wyeth), a colloidal suspension of kaolin with aluminium hydroxide.

After this initial preparation of the vagina the author has used many types of treatment. Those used are listed in their order of success in these cases: (i) insufflation with silver picrate powder, (ii) insufflation with "Aldasone" powder, (iii) insertion of "Stovarsol" tablets, (iv) insertion of "Devegan" tablets, (v) packing of the vagina with aluminium acetate, (vi) painting with merthiolate solution, (vii) painting with Bonney's blue paint, and (viii) insufflation of powdered quinine.

It should be mentioned that some workers consider that an interdependent state occurs between the trichomonad and a streptococcus.

The treatment which gave the best results in the cases under discussion was insufflation with silver picrate powder (Wyeth), as stated in connexion with the treatment of *Monilia albicans* vaginitis.

*The Use of the Knee-Chest Position.*

The vagina is cleansed and dried, as stated earlier, the patient being in the lithotomy position. Then, however, in several cases the patient was placed in the knee-chest position so as to produce a natural ballooning of the vagina because of the dragging upwards and outwards of the vaginal vault by the uterus *et cetera*. (This method does not appear to have been mentioned before.) In this position the insufflator nozzle is inserted and the rubber guard is fixed tightly against the introitus. A few squeezes of the bulb distribute the powder (from the five-gramme vial) over the vaginal vault. The rubber guard is held for a few moments against the introitus and then very gently removed, so that the impounded air will not suddenly blow the powder out. After this the nozzle is withdrawn and the powder is dusted over the vulva. The distension of the vagina has smoothed out most of the rugæ and the whole surface is covered with the powder.

Supplementary treatment with silver picrate suppositories (Wyeth) is then instituted on the evening following insufflation and repeated for six nights; the patient is warned to wear a pad to avoid staining of linen.

Insufflation is repeated in seven days and is followed by further treatment with suppositories. No douching or intercourse should take place during the course of treatment, and plunge baths should also be avoided during this period.

**Summary.**

1. Treatment of *Monilia albicans* vaginitis by the insufflation of silver picrate powder has been shown to be effective.

2. Insufflation into the vaginal vault with the patient in the knee-chest position is suggested as an advantage in the treatment of *Trichomonas vaginalis* vaginitis.

## Reports of Cases.

### A CASE OF GASTRIC POLYPOSIS.

By KEITH J. B. DAVIS,
*Tamworth, New South Wales.*

**Clinical Record.**

D.P., a female patient, aged forty-seven years, an invalid pensioner, gave the following history on January 23, 1940. Nine months previously she had complained of a first attack of indigestion. These attacks continued and were occasioned by food of a hard nature; they consisted of a feeling of fullness and discomfort. Five months ago the patient first experienced pain in the epigastrium half an hour after taking any food; this pain was relieved temporarily by taking more food. She had a throbbing sensation in the epigastrium when hungry. Nausea and vomiting had been present for four months; the patient vomited once a day, but the vomitus was not excessive in amount. It always contained coffee-ground material

but no bright blood. The patient found that she could not take much food at a time. The bowels were well open with aperients, and the motions were dry and black in appearance. She had been anæmic for five and a half years. She had some frequency of micturition, passing urine twelve times during the day and five or six times at night. There was no scalding. The menopause had occurred suddenly on the death of her husband. The patient complained of hot flushes, of dyspnœa on slight exertion of six years' duration, of swelling of the legs of two weeks' duration, and of constant headache. She had no cough. Her father died of heart failure at the age of ninety years, her mother died from cancer of the uterus, two sisters have arthritis, one sister has asthma, and the patient's husband died of cerebral hæmorrhage.

On examination the patient was seen to be a slightly built anæmic woman, lying comfortably in bed. The abdomen moved freely on respiration, but a softish mass was present in the epigastrium and extended to the umbilicus. The mass was freely movable and was not acutely tender; it was not attached to the liver and no tympanitic band was present over it. The throat, mouth and teeth were normal. A rectal examination revealed no abnormality. The apex beat was four and a half inches from the middle line in the fifth left intercostal space. The cardiac dulness extended to the third rib in an upward direction, to the right sternal border and four and a half inches to the left of the middle line. The systolic blood pressure was 140 and the diastolic pressure 90 millimetres of mercury. No abnormality was detected in the lungs. Slight œdema of both ankles was present. A blood count gave the following information:

| | |
|---|---|
| Erythrocytes, per cubic millimetre .. | 3,600,000 |
| Hæmoglobin value .. .. .. .. | 51% |
| Colour index .. .. .. .. .. | 0·7 |
| Leucocytes, per cubic millimetre .. .. | 5,800 |
| Neutrophile cells .. .. .. .. | 76·5% |
| Monocytes .. .. .. .. .. .. | 2·5% |
| Lymphocytes .. .. .. .. .. | 20·0% |
| Eosinophile cells .. .. .. .. | 1·0% |

Occult blood was present in the stools.

An attempt was made to examine the resting gastric juice after a fractional test meal, but two pints of coffee-ground material, acid, evil-smelling and containing a few leucocytes, were withdrawn. The figures obtained on examination for free acid and total acid were as follows:

| | Free Acid. | Total Acid. |
|---|---|---|
| Resting juice .. | 26 .. | 32 |
| Quarter hour .. | 12 .. | 16 |
| Half hour .. .. | 10 .. | 17 |
| One hour .. .. | 30 .. | 37 |
| One and a half hours | 28 .. | 32 |
| Two hours .. .. | 22 .. | 26 |

Blood was present in all specimens, but there was no lactic acid. Bile was present in the first specimen.

Radiographic examination after an opaque meal revealed an irregular filling defect of the lower third of the stomach, ptosis and loss of peristalsis.

Before operation the stomach was washed out, and after repeated washings it was still possible to obtain coffee-ground material. A transfusion of 700 cubic centimetres of blood was administered the evening before operation.

On February 7, 1940, the abdomen was opened by a paramedian incision six inches in length. The stomach was surrounded by adhesions and was much dilated and thickened. No discrete mass was present in the stomach, but the stomach appeared to be full. Owing to the wide extent of the polypoid condition, nothing less than a total gastrectomy would have been sufficient to eradicate the lesion. As the patient's condition would not stand this, a posterior isoperistaltic gastro-jejunostomy was performed to facilitate the emptying of the stomach. This was done in four layers, with a fifth layer reinforcing the fourth layer. When the stomach was opened, gelatinous-looking polypi were found—an indication of profuse polyposis in the stomach. The stomach was sutured to the transverse mesocolon and the abdomen was closed in layers.

Pathological examination of the polypi revealed normal epithelium covering a connective tissue stroma. The patient has made an uninterrupted recovery but is still a little anæmic.

### Discussion.

This case, in my opinion, is one of fibro-adenomatous polyposis of the stomach, of the *polyadénome polypeux* type.

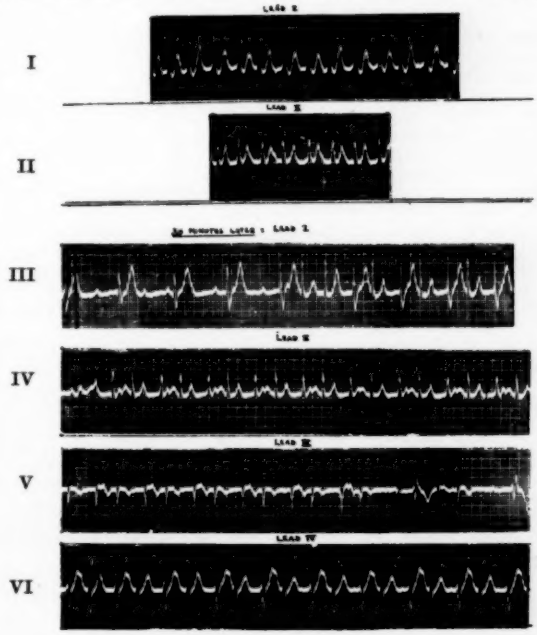
About 0·9% of all gastric tumours are fibro-adenomata, and they are more common in men than in women. Fibro-adenoma occurs generally after forty years of age, and is thought to be congenital; but other predisposing factors may be chronic gastritis, alcoholism, dietetic errors, arterio-sclerosis and syphilis. Polyposis of the stomach has been produced experimentally in animals fed on worm-infested cockroaches; but in man it is not a common concomitant of chronic gastritis. There are two main forms. The first is *polyadénome polypeux*, which is a discrete pedunculated tumour, single or multiple, projecting into the lumen on a narrow stalk. It arises near the necks of the gastric glands. Microscopically there is a core of fibrous tissue supporting columnar epithelium. This condition is not familial, and, unlike multiple polyposis of the colon, does not commonly become malignant. The second form is *polyadénome en nappe*, a flat-topped, plaque-like projection from the mucosa; it may be single or multiple. It arises mainly from the deeper portions of the gastric glands.

## A CASE OF ACUTE BACTERIAL ENDOCARDITIS WITH RUPTURE OF THE AORTIC VALVE AND UNIQUE TERMINAL ARRHYTHMIA.

By R. WHISHAW,
*Hobart.*

### Clinical Record.

A SINGLE woman, aged thirty-two years, was admitted to hospital on June 17, 1939, and died five days later. She stated that she had been in good health until two weeks before her admission, when she had had a shivering attack and had gone to bed with fever, headache and pains in her limbs. Her family physician saw her a few

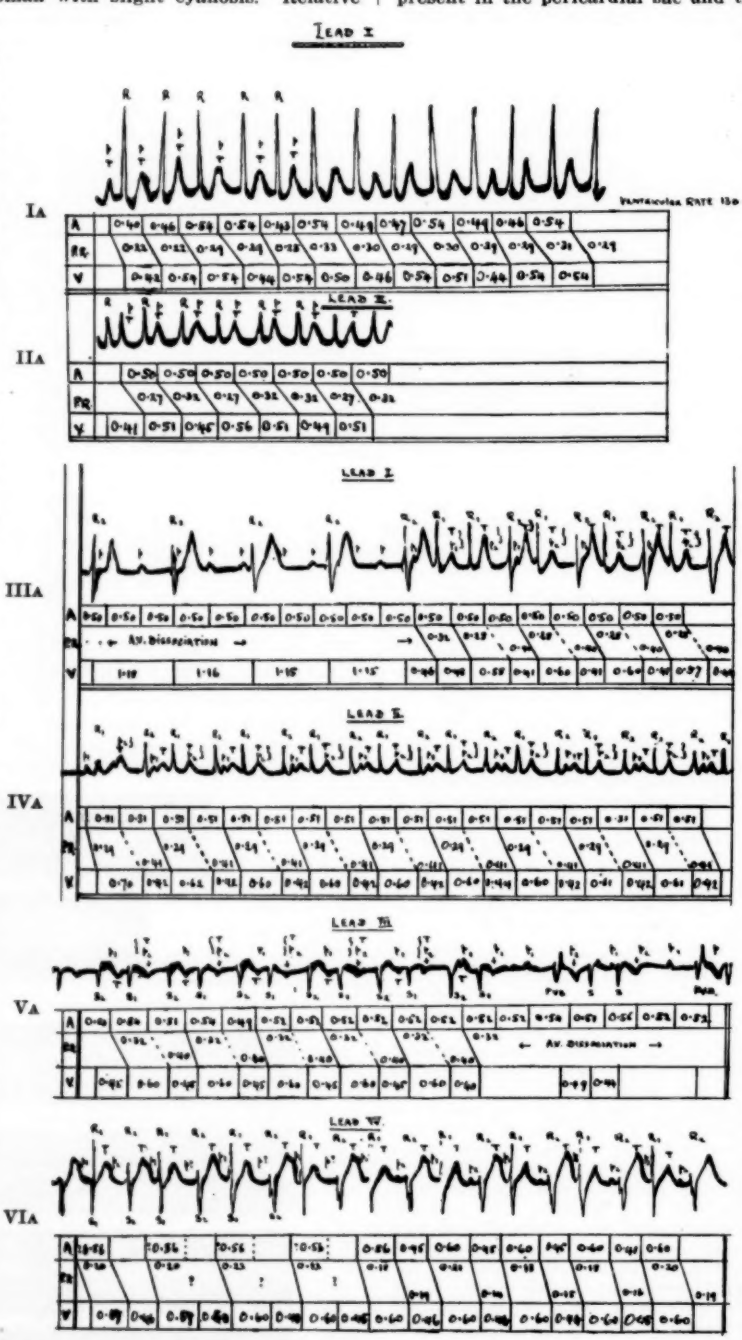



days later on account of continued cough and pains in the chest, and she was admitted to hospital with a provisional diagnosis of influenzal bronchopneumonia.

Examination by a resident medical officer revealed that her temperature was 104° F.; her pulse rate was 120 per minute and the respirations numbered 40 per minute. She was an obese woman with slight cyanosis. Relative dulness was noted at the base of the right lung, and moist sounds were present. The first heart sound at the base was loud.

After three days in hospital her temperature and pulse rate fell to normal, and she appeared to have recovered; but next day she suddenly appeared very ill, although she complained only of slight soreness of her throat. I saw her at this stage in consultation for the first and only time, as she died a few hours later. She maintained stoutly that she was quite well, but it was obvious that her condition was desperate.

The clinical picture was one of severe shock, marked by great pallor, a rapid feeble pulse, rapid shallow respiration and cold damp skin. She was too ill for me to make a detailed examination, and the thickness of her chest wall made a satisfactory study of her heart difficult. It was thought to be enlarged, and a rough systolic murmur was present at the base; and although the second sound was very faint, no definite diastolic murmur could be heard. No venous engorgement, no œdema and no liver enlargement were present. The systolic blood pressure was 130 and the diastolic pressure 80 millimetres of mercury; there were a few crepitations at the base of the right lung. The spleen was not palpable. A skiagram of her chest, taken by a portable machine, confirmed the presence of cardiac enlargement. An electrocardiographic examination was made, but she died before further investigations could be carried out.




## Discussion.

Clinically the picture suggested rupture of an aortic cusp; but free aortic incompetence was not apparent. I thought the lesion was due to specific aortitis or to septic endocarditis.

At the *post mortem* examination a little free fluid was present in the pericardial sac and the heart was generally enlarged; both ventricles were dilated and the myocardium was soft. The aortic cusps were thickened by old rheumatic valvulitis, and on them were recent vegetations; a small rupture of one cusp, possibly a mycotic aneurysm, was present.

The membranous septum was involved and vegetations were present on the tricuspid valve, especially in the region beneath which passes the bundle of His. The spleen was enlarged, and old and recent infarcts were present; the latter were also present in the kidneys and liver.

### *Electrocardiogram.*

Dr. Paul D. White, of Boston, United States of America, kindly sent the following comment on the electrocardiogram:

"My conclusions are as follows, though they are open to question, I am sure.

"1. The first tracing shows partial *a-v* block with long and variable *P-R* intervals ranging from a little over 0·2 to a little over 0·3 second. That is decidedly unusual, but I have seen something of the sort at faster heart rates [see Figure I].

"2. In the third and fifth tracings there are apparently runs of complete auriculo-ventricular dissociation [see Figures III and V].

"3. In the second and fourth tracings there is, I think, either an alternation of the *P-R* intervals in partial auriculo-ventricular block (the intervals alternate between 0·29 and 0·41 second), or 2 to 1 auriculo-ventricular block with a *P-R* of 0·29 second and ventricular escape in the case of the other *QRS* waves (after 0·41 second). We have 2 to 1 bundle branch block and auriculo-ventricular block; why not alternating length of *P-R* interval, even though it is unique? [See Figures II and IV.]

"4. The sixth tracing apparently shows a bigeminy due to auricular premature beats with *P-R* intervals alternating in length [see Figure VI].

"5. Finally, there is occasional alternation of the intraventricular conduction as well as of the *P-R* intervals, especially well shown in tracings 3 and 6.

"The unusual features of this case of yours make it worth a brief case report. The interpretations I have given you are subject to revision. They are not far from what you yourself thought."

# Reviews.

## PATHOLOGICAL HISTOLOGY.

A RECENT publication, entitled "Pathological Histology", by Robertson F. Ogilvie, has been written for use by all students of medicine, undergraduates and graduates alike.[1]

The book is based on a series of lectures in pathological histology delivered at the University of Edinburgh, and it is characterized by the excellence which is a feature of pathology in the Scottish medical schools. The volume is illustrated by 220 photomicrographs in colour, the work of Mr. T. C. Dodds, Fellow of the Royal Photographic Society and senior technician in the Department of Pathology of the Edinburgh University.

As Professor Murray Drennan points out in his appreciative foreword, these illustrations have the advantage that they show not only the morphology of the lesion, but also the staining reaction of the tissues. The coloured illustrations are particularly helpful where special staining methods have been employed.

The book does not replace text-books of pathology; it is complementary to them. The subject is dealt with in the usual order; first comes general pathology, including chapters on degeneration, vascular disturbances, inflammation, repair and tumours; then follows special pathology, with chapters on the special diseases of the systems.

The plan adopted by the author is to give an outline of the pathological condition to be studied, followed by a brief description of the gross features and a detailed description of the histological characters. The appropriate illustrations are to be seen close by the text.

The book is well produced and is a credit to the block makers, Graphic Arts Limited, London and Woking, and to the publishers, E. and S. Livingstone, Edinburgh.

## DIVERTICULA AND DIVERTICULITIS OF THE INTESTINE.

"DIVERTICULA AND DIVERTICULITIS OF THE INTESTINE: THEIR PATHOLOGY, DIAGNOSIS AND TREATMENT", by Harold C. Edwards, is a work of considerable merit.[2] The book contains the subject matter that won the Jacksonian Prize in 1932, and the author tells us that it has been brought up to date, with which all readers will readily concur.

No part of the subject has been neglected. The historical, pathological and radiological aspects are thoroughly gone into, and the therapeutic measures, both medical and surgical, are fully discussed. The method of formation of diverticula, their pathology and treatment are expounded and are of interest, as diverticula are always a source of worry to physician and surgeon. Were diverticula of the œsophagus included, an interesting and valuable chapter would make the work more complete.

Many readers will be surprised to learn that giant diverticula of the ileum, twenty-eight and a half inches long, have been found. Surgeons will note that when diverticula of the duodenum are causing symptoms, short-circuiting will not cure the symptoms. Duodenal pouches have been known to cause jaundice, hæmatemesis and pancreatitis from contact with the accompanying diverticulitis. Gall-stones have been found in a duodenal diverticulum. No part of the intestinal tract is immune from the formation of diverticula, which tend to increase in size with advancing years. Diverticulitis of the large bowel is the condition that causes most concern to surgeons and physicians. It is a comparatively common affliction in both sexes over forty-five years of age.

Cancer rarely supervenes on diverticula; but it does occur, though no causal relationship between diverticulitis and cancer has so far been established. For symptomless diverticulitis a special dietary is recommended; for those causing symptoms, dieting and lavage are advised; for those cases resistant to the above treatment, various operative procedures are discussed.

No fault can be found with the book. The arguments are sound, the general "get up" is first class, the drawings are simple and explicit, and the coloured drawings are particularly life-like.

The words of Gordon Gordon-Taylor, who is so well known and respected by Australian surgeons, are apt: "I am writing this foreword for Harold Edwards's book full of enthusiasm and of confidence in the certain welcome that awaits its reception from his own profession, in which his surgical enterprise and endeavour command the admiration of all." And with this we fully agree.

## MATERIA MEDICA.

HALE-WHITE'S "Materia Medica" has attained under the editorship of A. H. Douthwaite its twenty-fourth edition.[1] A text-book of this standing is a reliable summary of accepted opinion, and the amendments incorporated in the new edition are particularly interesting. The more important additions are the sulphonamides, which have a new chapter to themselves, magnesium trisilicate, "Felamine", "Decholin", tetrachlorethylene, "Butolan", ammonium and calcium mandelate, cyclopropane, "A.B.A.", "Decicaine", "Doryl", "Mecholyl", and many hormonal preparations. The chapters on the hormones and the vitamins have been rewritten to include recent advances in knowledge and practice. The section dealing with sodium and potassium has been recast. Structural formulæ are given for the sulphonamides and hormonal preparations, an innovation which could be extended usefully to other drugs.

The book has not been increased in size. This has been accomplished by a drastic curtailment of the space allotted to volatile oils, and by omission of the description of the physical characteristics and the less important active principles of the vegetable drugs. The growing supremacy of the chemical laboratory over Nature as a source of *materia medica* is illustrated strongly in these changes. The advancing triumph of science over tradition is also evident in the therapeutic sections. The therapeutics of the newer synthetic drugs is presented prominently. Glucose, "Eumydrine" and quinidine are given more consideration than formerly. The value of diastase in malt, of volatile oils, and of creosote and guaiacol is depreciated. Tar water, ice poultices to the chest, lithium, cassia, and sulphurous acid have been omitted from the therapeutic armamentarium. Strangely, croton oil is retained.

One or two mistakes in previous editions have survived. The dose of cod liver oil has not been amended on page 21. This is trivial; but the intrathecal dose of magnesium

[1] "Pathological Histology", by R. F. Ogilvie, M.D., F.R.C.P., with a foreword by A. M. Drennan, M.D., F.R.C.P.; 1940. Edinburgh: E. and S. Livingstone. Demy 8vo, pp. 342, with 220 photomicrographs in colour by T. C. Todds, F.R.P.S., F.I.B.P. Price: 27s. 6d. net.

[2] "Diverticula and Diverticulitis of the Intestine: their Pathology, Diagnosis and Treatment", by H. C. Edwards, M.S., F.R.C.S., with a foreword by G. Gordon-Taylor, O.B.E., M.S., F.R.C.S.; 1939. Bristol: John Wright and Sons Limited. Medium 8vo, pp 347, with illustrations. Price: 25s. net.

[1] "Materia Medica: Pharmacy, Pharmacology and Therapeutics", by W. Hale-White, K.B.E., M.D., LL.D.; Twenty-fourth Edition, revised by A. H. Douthwaite, M.D., F.R.C.P.; 1939. London: J. and A. Churchill Limited. Crown 8vo, pp. 561. Price: 12s. 6d. net.

sulphate which is still recommended on page 102 is seriously excessive. Ammonium chloride is stated to be excreted unchanged, though its property of acidifying the urine is emphasized. In the discussion on antiseptics the important factor of concentration is omitted. These, however, are minor blemishes in this excellent text-book, and this latest revised edition retains all the qualities which have made it so popular in the past.

## THE STUDY OF ANATOMY.

A FOURTH edition of Professor S. E. Whitnall's little book "The Study of Anatomy" has recently been published.[1] It tells of the scope of anatomy, its place in a medical curriculum, methods of study, of examinations and of books, for both technical and general reading. To the true student, the book, in addition to being of great value, will be a delight; as one reviewer wrote: "Osler would have loved it"; and the author has himself the Osler "touch", and in that touch there is the humanity of an "Elia".

A new section tells of anatomy in relation to preventive medicine. The fact that this section and the other additions are printed in the smallest type does not accord well with the advice given under "Eyes", namely, avoidance of eye strain. We should like to see the author expand this section into two or three new chapters.

The second addition concerns physical exercises, at which the author admits having a "mild tilt". Anatomy should have much more to offer the physical fitness movement than this. Anatomists and physiologists should have positive contributions to make to the anatomy and physiology of movement. There is a place for both subjects in the science of physical education.

Professor Whitnall, in his last addition to this volume, namely, on teaching and lectures, agrees with the statement of Professor Sheehan: "After two years in the dissecting room, the great majority of students reach their final year with little anatomical knowledge." Is this surprising? How much of languages and mathematics do students remember after a lapse of time equal to that between third and sixth years of a medical course? It is only practice that makes perfect.

Many clinical teachers also are of the opinion that two years spent in a dissecting room are far too long in the time allotted for undergraduate medical education. Students become "stale" and mentally weary after continuous efforts at memorization. Other anatomists (and physiologists) should be impressed with the fact that the medical student requires only a portion of their sciences, and what is needed is a course of study that will make the student master of those sections of anatomy that he will require in general practice. The medical course in the opinion of many needs shortening, not lengthening.

The additions (including a more extensive bibliography) make up only a small portion of Professor Whitnall's book, a publication which can be strongly recommended to all students, practitioners and teachers.

## DISEASES OF THE BLOOD.

THAT three editions of "Disorders of the Blood",[2] by Whitby and Britton, should appear within four years is an indication of the excellence of this British work. The more recent advances incorporated in the third edition concern particularly the hæmolytic anæmias, sternal bone marrow biopsy, and certain of the hæmorrhagic states.

The experiments of Dameschek, Schwartz and Gross on hæmolytic anæmias are summarized. According to the dose of rabbit's serum containing guinea-pig hæmolysin given to guinea-pigs, they could produce either fulminating or subacute hæmolytic anæmia. Changes such as microspherocytosis, reticulocytosis and increased fragility of the red blood corpuscles could be produced at will. Spherocytosis, on which depends increased fragility, thus appears to be due to the activity of a hæmolysin and not to an abnormality of the bone marrow.

Cases classed as "acquired" acholuric jaundice do not seem to differ from those described later as subacute or chronic idiopathic hæmolytic anæmia, and it would seem that examples of the true acquired type would be more satisfactorily classified merely as subacute or chronic hæmolytic anæmia. In this latter condition splenectomy is said to be usually of no value. There certainly are occasional cases in which it is, in our experience, most valuable.

Of recent advances in connexion with the hæmorrhagic states, mention may be made of the intradermal test with one or two units of moccasin snake venom. This gives information of diagnostic and prognostic value in these disorders. X ray therapy to the spleen and the use of vitamin *P* have been disappointing in essential thrombocytopenia. For prevention of undue bleeding in cases of obstructive jaundice the use of vitamins *D* and *K* with bile or bile salts and quarter erythema doses of X rays to the spleen are recommended before operation.

In numerous sections throughout the book the value of bone marrow biopsy is critically reviewed in the light of the personal experience of the authors. They emphasize the superiority of trephining over puncture of the sternal bone marrow. In childhood a definite and intractable anæmia with neutropenia demands a sternal biopsy to exclude leuchæmia. An anæmia of unknown origin resisting treatment is another indication in adult life for this investigation. In suspected cases of aleuchæmic leuchæmia the blood should be centrifuged in a Wintrobe's tube and smears made from the leucocytic layer. This is worth while in any obscure anæmia.

Enough has been written to show that the authors have been successful in bringing this edition up to date. It remains one of the best books on this subject in our language.

# Notes on Books, Current Journals and New Appliances.

## A CATALOGUE OF PHARMACEUTICAL AND BIOLOGICAL PRODUCTS.

THE "Parke-Davis Blue Book" is a reference catalogue of pharmaceutical and biological products of the firm of Parke, Davis and Company. It is replete with information on the composition, formulæ, therapeutic properties and methods of administration of selected preparations. Though naturally the products dealt with are those of the firm, the book is more than a mere proprietary catalogue. The section on sex hormone therapy is particularly helpful, and the colour diagrams depicting the menstrual cycle in various conditions are clear and easy to understand. The treatment of syphilis and vitamin preparations receive special attention. There is a useful table dealing with some of the common skin tests—the headings include the material used, the amount injected or applied, the method of application, when the result of the test should be read, and the appearance of a positive reaction. Medical practitioners who receive a copy of this book will be well advised to keep it for reference in a place easy of access.

[1] "The Study of Anatomy Written for the Medical Student", by S. E. Whitnall, M.A., M.D., B.Ch., M.R.C.S., L.R.C.P., F.R.S.; Fourth Edition, revised and enlarged; 1939. London: Edward Arnold and Company. Crown 8vo, pp. 130.

[2] "Disorders of the Blood: Diagnosis, Pathology, Treatment and Technique", by L. E. H. Whitby, C.V.O., M.C., M.A., M.D., F.R.C.P., D.P.H., and C. J. C. Britton, M.D., D.P.H.; Third Edition; 1939. London: J. and A. Churchill Limited. Royal 8vo, pp. 615, with 12 plates and 61 text figures. Price: 21s. net.

The Medical Journal of Australia

SATURDAY, MAY 18, 1940.

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## THE ANIMAL BREEDER, THE FARMER AND THE DOCTOR.

A PLEA can be put forward in all seriousness that the accumulated experience of breeders and of farmers in the nurture of domestic animals should be carefully investigated with a view to the possible application of some important principles to the human being. Readers of Charles Darwin's great book on natural selection need no reminder of the splendid use this "Copernicus of Biology" made of information received from the stable and the kennel, and indeed today the hypotheses of genetics are put to more serious tests and checks on the land than in the laboratory. Modern veterinary medicine is studied with the same rigorous attention to accuracy as human medicine; for example, the uses and dangers of the latest antistreptococcal drugs are as well known to the younger generation of veterinarians as they are to the physicians whose patients are human. No doubt there is much in modern veterinary science from which we in human medicine could obtain valuable hints, for the veterinary expert possesses the great advantage of being often able to command a *post mortem* at any stage of the disease investigated. At the same time, in the untutored and traditional ideas of the animal fancier some grains of pure gold are likely to be found. Much no doubt is folk-lore pure and simple, and much cannot stand scientific analysis; for example, most breeders believe in maternal impressions and also in telegony, that is, the supposed transmission of characters from a previous male to offspring of the same mother by a later sire; indeed so well established is this belief that it has been accepted legally as lowering the market value of the female; but to the scientific biologist the falsity of both contentions is self-evident. Still, the recent striking confirmation of some old lore of the fancier should make us pause before dismissing any of their ideas in cavalier fashion.

It is in matters of nutrition that we are likely to learn something. Fanciers many years ago were aware that cats were healthier when there was liver in their diet; the more Persian blood in the breed, the more liver was required. In the absence of liver an anæmia was certain to arise. Coprophagy in parrots was easily stopped by giving the birds capsicum; we now know that coprophagy in almost all cases is due to avitaminosis and that capsicum is particularly rich in ascorbic acid and in the flavone vitamin *P*. Horse trainers have long given linseed oil to improve the coat and produce an attractive gloss, and anyone who has seen the quick response of the horse to this treatment will not need any further convincing as to the fact. Now we are informed that linoleic acid has been added to the list of vitamins as vitamin *F*. Indeed it may be asserted that the animal breeder and trainer have paid far more attention to the epidermis and know far more about its changes with alterations of diet than the human pathologist or clinician. With the skin may be included the subcutaneous fat, to which much skilled observation and dietary experiment have been given on the farm. A buyer can tell at once by the feel of a pig's back whether the beast has been largely fed on fruit, and it has been claimed that there are detectable differences according to whether potato or pollard preponderates in the swill. We may search human physiology and pathology in vain for any recognition of the fact that the skin and subcutaneous tissues vary in a marked manner with the diet, but

that the human should be different from the lower animal is hardly credible. It is again experiments on domestic animals which have given us the new lore of "trace elements", such as cobalt, copper and manganese, which are necessary for proper functioning.

That a horse becomes affected by dyspnœa more readily when bran has been too abundant in its feed is a widespread belief based on something more than conjecture. One explanation which has been advanced is that the heart fat has been increased. This may well be the case, and incidentally one may ask the question why the heart should be burdened with fat in any circumstances; and this leads to the further question, ignored by muscle chemists, why the myocardium should be so rich in sterols. Then we have the remarkable and catastrophic illness of the horse when it has had access to unlimited wheat in grain. Why of all tissues of the body the laminæ of the foot should be singled out for inflammation, and why any inflammation at all should ensue, are questions to which no answer has been given. A distinguished pathologist visiting Australia recently treated this matter as a fairy tale and laughed contemptuously at the idea until an assurance from an Australian physician who had experience of farming made him less confident in his disbelief. Within the past twelve months we have learned that large amounts of oatmeal in human food will, unless there is excess of calcium, produce degeneracy of bone and a condition allied to rickets. Too much oats has long been condemned by the horse trainer; the resulting condition is not an avitaminosis, but is due to the presence in the oat grain of phytic acid, which combines with calcium and renders it unabsorbable. The wheat poisoning, however, remains a mystery. It is curious to observe in this connexion that the American physiologist and nutrition expert, McCollum, before he became an enthusiastic investigator of vitamin deficiency, believed that the wheat germ contained a toxic substance. It is just possible that he has carried his recantation too far. The existence of a constituent of wheat-germ oil that produces sarcomatous growths in rats has recently been announced.

Apart from nutrition and genetics there are other aspects well worth considering. The dog fancier knows that the hardness of the tooth and its firmness in its socket can be improved by biting exercises, and he encourages the puppy to worry increasingly tough material. That his children's teeth would be the better for some dental exercise never occurs to him. The medical world has more than once been agitated over the possible action of competitive athletics at the school age, partisans on both sides being most dogmatic in their opinions. Perhaps a quiet talk with a horsey man who trains horses for racing or trotting, or with the plain farmer on what should and should not be expected from a two-year-old, might enlighten the debate.

## Current Comment.

### BREATHING MACHINES.

THE machine known as the "iron lung" has a strong appeal to the popular imagination and its use has become widespread since Lord Nuffield, by his splendid benefaction, made machines available to hospitals throughout the Empire. The great help that it has given to many paralysed persons may quite easily create the impression, not only among the laity, but among some medical practitioners, that the machine is all that can be desired and that the problem of mechanical respiration has been solved. Nothing, of course, would be further from the truth, and this is recognized by all who enjoy authority on the subject. Readers will remember that in a discussion on poliomyelitis held in Melbourne in December, 1937, F. V. G. Scholes, of the Infectious Diseases Hospital, Fairfield, spoke with great enthusiasm of the lives that had been saved by respirator treatment; he said that between forty and fifty patients were receiving this treatment at Fairfield at the time when the discussion was held. At the same time he declared that the problems associated with respirator treatment were manifold. It will thus be clear that considerable interest is attached to the recent issue of a report, "Breathing Machines and their Use in Treatment", by the Respirators (Poliomyelitis) Committee of the Medical Research Council of the Privy Council.[1]

In the preface we are informed that before Lord Nuffield's gift to the Empire was announced the Medical Research Council had appointed a committee to examine the various forms of machine

[1] "Medical Research Council of the Privy Council. Special Report Series, No. 237: Report of the Respirators (Poliomyelitis) Committee: Breathing Machines and their Use in Treatment; 1939. London: His Majesty's Stationery Office. Medium 8vo, pp. 104. Price: 2s. net.

available and to consider the problem from the physiological point of view, as well as from that of cost and distribution. After the gift was made the Ministry of Health asked for guidance regarding the supply of machines and their value, particularly in the respiratory paralysis of acute anterior poliomyelitis; the present report is the outcome. We do not propose to make an abstract of this document, but to state the main conclusions. Those who use mechanical respirators in their daily work will in all probability read the report; but we doubt whether they will find anything in it with which they are not familiar.

Artificial respiration is required for many conditions other than acute poliomyelitis; the commonest causes of asphyxia are drowning and gas poisoning, and in these a breathing machine is not required. The chances of recovery in these two conditions depend on the duration of the asphyxia and on the speed with which treatment is instituted; manual artificial respiration does all that is wanted, and it is often combined with the administration of oxygen alone or of oxygen with carbon dioxide. In fact the insistence on the value of manual artificial respiration is perhaps the most practical message conveyed by this report. We are told that anything which decreases enthusiasm for the manual methods of artificial respiration or which tends to diminish the number of persons trained in their employment, will do harm.

There is a natural tendency among doctors as well as laymen to credit a machine with greater powers than the manual method of artificial respiration and to delay or suspend manual methods pending the arrival of apparatus. It must therefore again be emphasized that the factor of greatest importance in the treatment of the acute asphyxias is the promptitude with which treatment is instituted, and no development or multiplication of apparatus for such treatment can compare in usefulness with the training of all members of the community in methods of manual artificial respiration.

Breathing machines are required only for protracted failure of respiration, and in these circumstances the patient is seriously ill and it is quite likely that he will die whatever is done for him. Respiratory paralysis is never an isolated symptom, and special forms of treatment other than artificial respiration are generally required. Obviously the management and nursing of patients in a breathing machine is a highly skilled and exacting procedure. It follows that under ideal conditions these machines will be concentrated at important centres; the patient will then be brought to the machine and not the machine to the patient. Manual artificial respiration or simple apparatus of an emergency type (such as the McKesson resuscitator) will be used while the patient is being transported to the machine—it is possible to transport such patients safely for long distances by ambulance, railway train or aeroplane.

The different types of machine are described and illustrated in this report. Readers will find a useful description of these machines in an article by H. Whitridge Davies in THE MEDICAL JOURNAL OF AUSTRALIA of November 2, 1935. It must suffice in this place to state that there are three types—the negative pressure cabinet, the negative pressure cuirass and the positive pressure girdle. The Drinker negative pressure cabinet and its modification, the Both machine (it is this that is being provided by Lord Nuffield), are those generally used. The committee issuing this report is not very enthusiastic about its value—or for that matter about the value of any of these machines. We are told in one place that the results with the Drinker type of machine are not good, and in another that the results are so bad that serious observers have doubted whether treatment in machines of the Drinker type is better than no treatment at all. Scholes and his fellow workers would not take this view. The general conclusion is that none of the machines at present available for artificial respiration is ideal for the purpose. The ideal machine would be equally suitable for all forms of respiration, it would be easily manufactured, stored and transported, and would be composed as far as possible of standard commercial elements, so that it could be made up as required in an emergency. It should not demand an unusual degree of skill in operation, nor interfere with other treatment. This is a high standard, and though the ideal may not be reached, we must agree that complacency with present-day attainment must not be allowed to discourage further research. Perhaps the position will be safeguarded if we look on the machine at present available as providing "only a temporary solution of the problem".

## CANCER OF THE TONGUE IN YOUNG SUBJECTS.

FROM the American University at Beirut, Syria, G. W. Saleeby reports the occurrence of a squamous-cell epidermoid carcinoma of the tongue in a girl, aged fifteen years.[1] The patient was first seen ten weeks after the appearance of a papule on the left border of the tongue, and the lesion then consisted of an ulcer, 1·5 centimetres in diameter, with a cord-like mass extending backwards. Biopsy revealed squamous-cell epidermoid carcinoma with pearls of keratinization. Removal was out of the question, on account of the backward extension along the lymph channels of the tongue, so irradiation was used. The primary lesion then disappeared; but a cervical metastasis on the side opposite the lesion could not be influenced. The patient died a year after the first signs of the lesion had been noticed. Saleeby gives some particulars of ten other cases of cancer of the tongue occurring in patients under twenty years of age and recorded in the literature. In none of these cases was any mention made of mechanical irritation, such as that caused by defective teeth. In none was there any mention of a so-called precancerous condition, such as leucoplakia or syphilis. No patients came from a "cancer family" and none showed signs of hereditary syphilis. None gave a history of tobacco chewing or smoking.

[1] *The American Journal of Cancer*, February, 1940.

# Abstracts from Current Medical Literature.

## THERAPEUTICS.

### Vaccine Therapy in the Rheumatic Patient.

HARRY WEINER (*New York State Journal of Medicine*, September 15, 1939) reports on the observation over a five-year period of the effects of vaccine therapy on the rheumatic patient. The effects of specific, non-specific and mild fever with non-specific vaccine were noted and compared. All forms of "rheumatism" were included, and the basis for inclusion was clinical evidence of an infectious arthritic state and elevated sedimentation rate. All associated therapy was avoided. The criteria for evaluating results were the degree of subjective improvement and the extent of objective changes and alterations in the sedimentation index. The specific vaccine used was a streptococcal vaccine represented as the pooling of several arthrotropic strains; the initial dose was one hundred million organisms, given intravenously twice a week; this was gradually increased to four hundred million organisms, and the frequency was reduced to once a week. No untoward effects were noted. The results obtained with the non-specific vaccine were about the same as with the specific. The author states that there is ample reason to question specificity in vaccine therapy in rheumatism, and to wonder whether any benefit that may accrue from such therapy is not basically non-specific. The effects of vaccine therapy seem to be in direct ratio to the sedimentation index. The better results are obtained where the index is high. Invariably when the index is normal or only slightly raised the effects from vaccines are negligible. The effects of a non-specific vaccine given intravenously and producing a mild fever are more impressive than those from the same vaccine given subcutaneously.

### Treatment of Acute Encephalitis.

GEORGE B. RETAN (*New York State Journal of Medicine*, September 15, 1939) describes in detail the treatment of acute encephalitis by intravenous injection of hypotonic salt solution. Discussing the rationale, he points out that the Virchow-Robins perivascular spaces play an important role in the treatment. During inflammatory changes in the central nervous system these spaces become choked with cells, chiefly of the lymphatic type, but also with polymorphonuclear cells and red cells in severe cases. When the transudation of fluid is increased in the depths of the inflamed areas, fluid seeping down the Virchow-Robins spaces washes quantities of these cells into the cerebro-spinal lake of fluid. The presence of these cells in fractions of cerebro-spinal fluid removed during treatment demonstrates forcibly the presence of perivascular cellular infiltration; further, by a count of these cells it is possible to gain a rough estimate of the extent of the infiltration. The procedure involves the performance of lumbar puncture while the patient is on a Bradford frame, prepared in such a way as to allow the rotation of the patient with the lumbar puncture needle *in situ*. An intravenous injection of hypotonic salt solution is then given, the usual strength being 0·375% of sodium chloride. The rate of injection is about 22 cubic centimetres per kilogram of body weight per hour. Injection at this rate is continued for three hours; the rate is then reduced by 25% and injection is continued for a further period of two hours. This rate is essential to produce the necessary change in the osmotic pressure. At hourly intervals two to three cubic centimetres of cerebro-spinal fluid are drained if the fluid flows from the needle in a stream. The pulse rate, respiration rate and blood pressure are recorded at frequent intervals during treatment. Food may be given during treatment. An injection is given once in every twenty-four hours for at least three or four days. The author has treated fifteen patients in this manner and all have been completely relieved of objective and subjective symptoms. Since the interchange of fluid occurs more readily at inflamed areas, the following conditions constitute contra-indications: bronchitis or any pulmonary inflammation, acute nephritis, cardiac weakness, pyuria and colitis.

### Magnesium Trisilicate in Gastric Hyperacidity.

C. G. REID (*The American Journal of Digestive Diseases*, June, 1939) has performed a series of experiments on thirty-six ambulatory patients suffering from gastric hyperacidity, to compare the action of magnesium trisilicate with that of a similar dosage of a mixture of sodium bicarbonate (two parts), calcium carbonate (two parts) and heavy oxide of magnesium (one part). The total gastric content of twenty-four fasting subjects was extracted through a small tube and its free and total acid values were determined. Magnesium trisilicate, in a dose of two grammes in 25 cubic centimetres of distilled water, was then given by mouth, and small fractions of gastric juice were aspirated every fifteen minutes for a period of four hours. A similar procedure was subsequently employed when the alkaline mixture indicated above was given. After the administration of the magnesium salt a moderate reduction of the gastric acidity was observed in fifteen minutes, becoming maximal after thirty minutes and being maintained for one hour; a gradual rise in the acid curve followed, reaching the original value in three hours. The use of the alkaline mixture resulted in a rapid reduction in gastric acidity, maximal in fifteen minutes; the curve began to rise immediately and had reached its original level in one and a half hours. Since the magnesium trisilicate gave a more prolonged period of reduced acidity, an attempt was made to determine whether or not the alternate administration of this substance and interval feedings would maintain the acidity at or near the lowered level throughout the day. Twelve subjects with uncomplicated duodenal ulcer were used for this experiment. Neither the magnesium trisilicate nor the alkaline mixture with the feedings caused persistent achlorhydria. Whereas both methods produced a substantial reduction in acidity, the reduction was of greater degree and more consistent when magnesium trisilicate was used. The author believes that magnesium trisilicate is a satisfactory substitute for the alkalis commonly used to control gastric hyperacidity; in the same dosage it is slightly less prompt in its neutralizing action; but the effect is more prolonged. Its chief advantages over the alkalis are that it has no effect on the bowel and it is not absorbed, the possibility of alkalosis being diminished.

### Oxygen Therapy.

THAT cyanosis is the main and only important indication for oxygen therapy in pneumonia is the gist of the remarks of M. A. Blankenhorn, in a clinical lecture (*The Journal of the American Medical Association*, October 7, 1939). He holds that there is a strong tendency to use oxygen needlessly. Severe anoxæmia can occur in the early stages of pneumonia, less often in the late stages. Anoxæmia usually occurs when many lobes are consolidated, when respiration is rapid and shallow (above 40 per minute), when there is moisture in the bronchial tree, and when wheezing is present. These circumstances can cause symptoms resembling the toxic effects of infection, for example: rising pulse rate, falling diastolic blood pressure, delirium, coma, headache, dimness of vision, abdominal distension and vomiting. Oxygen, successfully administered, should relieve the patient of these symptoms, if they are due to anoxæmia. There are many causes of failure in the administration of oxygen, even if technique is satisfactory. It cannot succeed if too much lung is consolidated or obstructed by exudate, or if the circulation is failing, or if toxic depression of the respiratory centre by infection or drugs is present. Oxygen tents are expensive, troublesome and difficult to operate; they are often hot and contain excessive carbon dioxide. Measures to correct these defects are necessary. Tents should contain 40% to 60% of oxygen. Face masks and face tents are as bad as tents in their irritating effect on delirious patients. Nasal

tubes and catheters are best for these patients. The catheter should be greased with liquid paraffin and the pharynx sprayed with oil. The rate of flow of oxygen should be six to ten litres per minute. If this does not relieve the patient of cyanosis, the catheter should be passed lower in the oropharynx or two catheters should be used. Oxygen therapy should be continued until it can be stopped without the appearance of cyanosis. It is most useful when there is much moisture in the air passages. With the best of technique oxygen may in certain cases be life saving to the pneumonia patient; but it is difficult to prove this. It is of minor importance compared with specific therapy. In capillary bronchitis, hæmorrhagic pneumonia, as in influenza, after corrosive gases, and in asthma complicated by pneumonia, oxygen can be the most important item of treatment.

## NEUROLOGY AND PSYCHIATRY.

### Pick's Disease.

FOUR fresh cases of Pick's disease are elaborately described by S. Miles Bouton, junior (*The Journal of Nervous and Mental Disease*, January, 1940), who calls attention to the absence of arteriosclerotic changes and senile plaques. The location of the lesions appeared to be independent of the blood vascular supply, and there was a striking difference in the degree of involvement of the affected areas in the brain. In the four cases the main features were similar, namely: the age of onset, the varied neurological findings, initial restlessness and emotional instability leading to eventual apathy, relatively intact memory, speech difficulties, and, with one exception, absence of convulsions. No treatment is available in such conditions. The terminal physical deterioration is followed rapidly by death.

### Group Therapy.

S. R. SLAVSON (*Mental Hygiene*, January, 1940) differentiates between "group therapy" and "therapy in a group" for those who suffer from minor mental disturbances and social maladjustments. The latter form of treatment has been in vogue for many years and is practised through discussion of one patient's problems in the presence of other patients as well as the therapist. In group therapy no discussion is initiated by the therapist, and interpretations are given but rarely. The author states that in this form of therapy the patients live and work together with benefit from emotional reorientation in an informal face-to-face relationship. Group therapy deals primarily with maladjusted children. If security and parental love cannot be found, the group endeavours to find suitable substitutes. Correction of the patient's behaviour comes from within the group; recognition, praise and encouragement help to build up self-esteem in those children in whom it has been crushed. The group recognizes the value of some genuine interest for the child's leisure time, and in fostering such interest often opens up hidden artistic talent. Group experiences resulting from ordinary contact in work and play result in better mutual understanding. Personality interaction between group members facilitates mental readjustment, thus preventing delinquency and such mental disorder as may arise from distorted habit reactions. Group therapy is of value in many types of social maladjustment in children who are morbidly shut in or who have day-dreaming tendencies or show extreme hyperactivity; it is of special value for dull children and for those who may be unduly repressed. It is unsuitable for those who habitually steal outside the home, active homosexual boys, neurotic delinquents, oral aggressives and compulsive homicidal types.

### Hemiplegia in Chronic Internal Hydrocephalus.

Two cases in which a false diverticulum caused by rupture of the ependyma was responsible for destruction of the pyramidal tract and hemiplegia are presented in a paper by D. W. C. Northfield and Dorothy S. Russell (*Brain*, Volume LXII, Part 3, 1939). The first case was that of a boy, aged five years and nine months, in whom, after a birth injury, a false diverticulum of the right ventricle developed; this was followed by chronic internal hydrocephalus and left hemiplegia. The second case was that of a girl, aged two and a half years, who came under medical care for enlargement of the head and left spastic hemiplegia. A false diverticulum was present in the right lateral ventricle. These cases are presented with a wealth of clinical detail, autopsy findings and ventriculograms. In the discussion of these cases the authors state that, while the hydrocephalus was evident, the hemiplegia was misleading. Distortion of the ventricle in the ventriculogram in one case led to the false diagnosis of a right occipital tumour. Hæmorrhage from birth trauma produced in both cases a chronic leptomeningitis, which was responsible for the hydrocephalus. The authors were unable to trace similar cases in the literature, but, owing to the vague description in older papers touching on hydrocephalus, feel dubious about claiming the present cases as unique.

### Nitrogen Inhalation Therapy for Schizophrenia.

IN introducing a new form of treatment for schizophrenia by nitrogen inhalation, F. A. D. Alexander and H. E. Himwich (*The American Journal of Psychiatry*, November, 1939) have endeavoured to bring about a state of diminished cerebral metabolism similar to that which they believe is responsible for the beneficial effects of insulin and "Cardiazol" shock. By inhalations of nitrogen the authors claim certain advantages over "Cardiazol" and insulin, namely: the cerebral anoxia is under complete control and can be terminated instantly; there are no convulsions; there is no confusion after treatment; no restraint is used; and the patients are cooperative and have no fear of the treatment. The average duration of treatment is about five minutes. The sequence of neurological changes in the nitrogen therapy is similar to that observed in insulin hypoglycæmia, except that they are reached more rapidly. The apparatus used in this treatment is that used in gaseous inhalation anæsthesia. Oxygen is delivered from an ordinary gas machine capable of producing an instantaneous and rapid flow. The patient breathes oxygen first; this gas is then shut off and pure nitrogen is turned on at the rate of six litres per minute. When the anoxia is sufficiently acute, the nitrogen is discontinued and oxygen is admitted rapidly to the mask. The patient wakes quickly, and after lying quietly for a few minutes is allowed to walk back to the ward. Treatment is given three times a week, and results so far have been as encouraging as any of the shock treatments.

### The Prognosis in Schizophrenia.

HARRY STALKER (*The Journal of Mental Science*, November, 1939) has made an historical review of the results of follow-up studies of schizophrenia published since the war of 1914-1918, and he has made a further study of results of treatment of patients by non-specific methods in Edinburgh between 1932 and 1937. In the latter series, 12% achieved complete remission, 8% a social remission, 9% were improved, 21% relapsed, and 50% remained unimproved. The author found that the following features were of favourable prognostic import: (i) healthy habits of reaction in the patient's previous life, (ii) a preponderance of environmental and psychogenic causes for the illness over the constitutional factors, (iii) an acute and recent onset of the illness, (iv) well-retained affective response in the illness, with absence of disharmony between the affect and the thought-content, (v) an acute type of schizophrenic illness which could not be fitted into any of the four standard sub-groups. Manic-depressive symptoms were favourable. The author could not find that the following features had any prognostic significance: family history of mental disorder, sex, educational achievement, age of onset, tuberculosis in the family, focal sepsis, presence of regressive symptoms, presence of hallucinations. Other aspects of schizophrenia were studied, but could not be definitely related to prognosis.

# British Medical Association News.

## SCIENTIFIC.

A MEETING of the Victorian Branch of the British Medical Association was held at the Austin Hospital, Melbourne, on November 15, 1939. The meeting took the form of a series of clinical demonstrations arranged by members of the honorary medical staff of the hospital.

### Osteogenic Malignant Disease.

DR. H. C. TRUMBLE showed a female patient, aged eleven years, who had been admitted to hospital on July 30, 1939. In October, 1938, she had fallen and injured the left shoulder, which had become swollen shortly afterwards. A month later the shoulder joint was disarticulated at the Children's Hospital, and Dr. Reginald Webster reported that he had examined microscopic sections; the cytological picture was indicative of an osteogenic origin for the tumour. In June, 1939, swelling and pain had appeared in the lower end of the left leg, and skiagrams prepared at that time revealed that an osteogenic sarcoma was present, arising from the lower end of the fibula, and that metastases showing bone formation had formed towards the base of each lung. From the time of the operation at the Children's Hospital the patient had undergone deep X-ray therapy at the Royal Melbourne Hospital, and further courses of that treatment had been given at the Austin Hospital. In October, 1939, following a complaint of pain in the right shoulder and right knee, a radiological examination revealed that metastases were present in the upper end of the humerus, in the glenoid fossa, and also in the head of the tibia and probably in the lower end of the femur. At the time of the meeting the child still had a moderate amount of pain and her general condition was poor. It was difficult to continue the deep X-ray therapy, as the child would not lie quietly on the table. Dr. Trumble commented that the condition was probably osteogenic sarcoma with multiple skeletal metastases, each reproducing the radiological appearances of the original lesion.

Dr. Trumble showed another female patient, aged twenty-one years, whose condition presented diagnostic difficulties. It was originally diagnosed as osteomyelitis of the lower end of the femur, and after a period of observation an operation was performed on April 12, 1939. The femur was guttered and yellow; fatty tissue was removed from the marrow cavity and adjacent bone. Professor MacCallum had examined the material and reported the presence of a tumour of Ewing's type. A course of deep X-ray therapy was begun on April 22, 1939, and it was shown from skiagrams prepared on July 20, 1939, that no further extension had occurred in the femur; but the appearances about the head of the tibia were suspicious, though the articular cartilage appeared to be intact. Dr. Trumble said that another course of deep X-ray therapy was started on October 20, 1939, and he showed from recent skiagrams that there were no evidences of extension of the disease and that the area of the original lesion appeared to be sclerosing.[1]

Dr. Trumble also showed a male patient, aged twenty-two years, upon whom laminectomy had been performed on March 1, 1939. Sclerosis and proliferation in the dorsal vertebræ had caused paraplegia. Various pathologists had reported on the biopsy material, and opinions had been expressed that the condition was secondary carcinoma or angio-endothelioma.

### Parathyreoid Tumour.

Dr. Trumble next showed a female patient, aged thirty-four years, whose condition had been originally diagnosed as secondary carcinoma of the head of the femur, but had eventually been found to be an example of generalized *osteitis fibrosa cystica*. This case has been reported in a review of *osteitis fibrosa*, by J. F. Hughes, in THE MEDICAL JOURNAL OF AUSTRALIA of December 2, 1939, at page 832. After the removal of a parathyreoid adenoma there was dramatic general improvement and rapid recalcification of the skeleton.

### Skeletal Tuberculous Disease.

Dr. Trumble then showed a series of patients to illustrate methods of bone grafting in tuberculous disease of the spine and hip. A woman, aged forty-four years, had undergone an operation on February 2, 1938, during which Dr. Trumble had fixed the hip by means of an extra-articular graft. The case was complicated by the fact that the other leg had been amputated previously below the ankle for tuberculous disease of the tarsus.

Dr. Trumble also showed a male patient, aged twenty-four years, to demonstrate the good functional result obtained by extraarticular grafting in tuberculous disease of the hip.

Dr. Trumble then showed a female patient, aged eighteen years, to demonstrate the operative fixation of the diseased hip joint by means of an extraarticular graft. Dr. Trumble explained that the graft was cut from the tibia and inserted between the ischial tuberosity and the region of the lesser trochanter, posterior to the sciatic nerve. He demonstrated from specimens and skiagrams the complete degree of fixation obtained, and emphasized the fact that the grafts became stronger with the passage of time because of firm bony union and modification of the trabeculæ, which eventually passed through the graft from the ischium to the femur.

### Spinal Lesions and Paraplegia.

DR. E. GRAEME ROBERTSON showed a series of patients to illustrate the neurological phenomena associated with various types of spinal lesions and of paraplegia. A man, while diving, had sustained a compressed fracture of the fifth cervical vertebra and had become completely paraplegic below the level of the lesion; he also had paralysis of the lower neurone type involving the fourth, fifth and sixth segments. Another man, aged thirty-six years, had tuberculous kyphosis involving the lower thoracic and upper lumbar segments; over a period of three years a typical lesion of the lower roots of the *cauda equina* had gradually developed. After immobilization on a plaster bed there had been progressive diminution in both the motor and the sensory loss.

Another patient shown by Dr. Robertson suffered from paraplegia complicating Paget's disease of the spine and skull; the paraplegia was due to the partial collapse of the body of the tenth thoracic vertebra.

The spastic gait typical of advanced disseminated sclerosis was illustrated in the case of a man in whom the disease had been present for many years, but who was still able to move about with the aid of a stick.

Dr. Robertson also showed a man, aged thirty years, suffering from complete flaccid paraplegia and definite flexor spasms brought about by the presence of a glioma of the cord. Dr. Robertson discussed briefly the disturbances in the function of the bladder associated with lesions of the cord and *cauda equina*.

### Pulmonary Fibrosis.

DR. C. H. FITTS showed a series of patients to demonstrate the general phenomena and clinical signs associated with pulmonary fibrosis. He also showed lantern slides illustrating the development and progress of fibrotic lesions.

### Orthopædic Conditions.

DR. BRYAN KEON-COHEN showed a series of patients to illustrate a variety of orthopædic conditions, including Scheuermann's disease, Volkmann's contracture, Perthes's disease, scoliosis and spinal tuberculosis.

A girl, aged twenty-two years, was suffering from *osteochondritis deformans juvenilis* of the Scheuermann type. For nine years she had been known to have had

[1] We have been informed that since the meeting the patient has sustained a fracture of the femur.

kyphosis involving the lower thoracic segment of the spine, of gradual onset and slow progression. The diagnosis had been made with the assistance of skiagrams in November, 1938, and since that time the patient had been treated by being kept recumbent on a Bradford frame and later on a plaster bed, with gradually increasing extension; regular spinal and postural exercises had been carried out, and the postural deformity had been materially reduced.

The boy, aged twelve years, who presented the typical radiological picture of Perthes's disease, had been under observation for nine months before his admission to the Austin Hospital on October 30, 1939. Dr. Keon-Cohen demonstrated the application of extension without the use of splints by fixing both the patient's legs to the end of the bed and raising the foot of the bed. He commented on the advantages afforded by allowing free movement at the hip joint, by preventing the possibility of weight-bearing, by the mild continuous extension, and by the performance of remedial exercises.

A child, aged thirteen years, had had a supracondylar fracture at the age of seven years. He was shown to demonstrate the treatment of Volkmann's contracture advocated by Dr. Keon-Cohen. This involved the use of plaster to keep the fingers extended and the wrist flexed, with graduation of the amount of extension at the wrist by wedging of the plaster.

Dr. Keon-Cohen also described how gross flexor contractures of the legs of a patient who had had spastic diplegia from birth had been gradually straightened with a long series of plaster casts and tenotomy of the adductor tendon.

With reference to the treatment of scoliosis, Dr. Keon-Cohen demonstrated the value of systematic breathing exercises in correcting asymmetry of the thorax, even of an advanced degree; he also showed how the special apparatus for promoting postural breathing was used to encourage respiratory expansion in the short axis of the thorax.

Dr. Keon-Cohen showed another patient to demonstrate the difficulty of diagnosis of tuberculous disease of the spine, even though the patient was under continuous observation. The patient had fallen from a horse seven years earlier, and pain in the right sacro-iliac region was attributed to the accident. Even when, some five years later, it was found that he was suffering from pulmonary tuberculosis, the cause of the pain was not apparent. The pain became worse about three months before the meeting, and from skiagrams Dr. Keon-Cohen was able to demonstrate evidence of a long-standing lesion of the adjacent surfaces of the second and third lumbar vertebræ with sclerosis and some kyphosis.

Dr. Keon-Cohen showed another patient to demonstrate recovery from incipient paraplegia complicating tuberculous disease of the spine, the method of general treatment and the management of the Albee graft operation.

DR. J. B. COLQUHOUN also presented a series of patients illustrating various orthopædic problems, with special reference to tuberculosis of the bones and joints. A young man with a discharging sinus in the foot of one year's duration was found to have tuberculous disease of the tarsus, with partial destruction and decalcification of the talus and navicular bones. Dr. Colquhoun stressed the bad prognosis of the condition, and recommended amputation as the method of choice in advanced cases.

A woman, aged thirty-five years, had suffered for some years from chronic pain in the back, and it was found that she had tuberculous disease of the two lower thoracic vertebræ. Dr. Colquhoun mentioned that the patient was also pregnant, and discussed the prognosis and the advisability either of terminating the pregnancy or submitting her to Cæsarean section at full term.

A young man who had had a limp for some months was shown by Dr. Colquhoun to illustrate the difficulty of diagnosis solely on the basis of physical examination and inspection of the skiagrams; there was evidence of very slight erosion of the acetabulum only. The diagnosis of tuberculous disease of the hip joint was supported by the recovery of *Bacillus tuberculosis* from the urine by the cultural method, although the patient had not at any time had any urinary symptoms.

Dr. Colquhoun also showed a girl suffering from advanced rheumatoid arthritis, to demonstrate how she had become able to walk again after operative correction and fixation of the deformities which had been present in the hips, knees and feet.

Dr. Colquhoun showed another girl suffering from rheumatoid arthritis, in whom a large renal calculus had developed after a long period of recumbency. It had become impacted in the pelvis of the ureter and had given rise to hydronephrosis. Dr. Colquhoun showed from excretion pyelograms that the pelvis had returned to normal size in six weeks after nephro-lithotomy; there had also been a noticeable improvement in the patient's general health and a diminution in the joint pains and disability.

Dr. Colquhoun also showed a young man who had been submitted to arthrodesis of the knee joint for the relief of chronic pain and stiffness following osteomyelitis of the head of the tibia. He showed in a series of skiagrams the progressive bony fixation of the joint.

### Amyloid Disease.

DR. A. J. M. SINCLAIR showed two patients suffering from amyloid disease.

A man, aged forty years, had had extensive cavitation throughout the right lung, which had become retracted, and fibrotic infiltration of the left lung. The course of the illness had been spread over four years, and the patient was producing about fifteen ounces of sputum daily, when, in July, 1937, a trace of albumin was found in the urine. By October, 1939, the albuminuria had become gross, the area of liver dulness extended a hand's breadth below the costal margin, and the patient was vomiting bile; the spleen was not palpable. A month later he had another gastric upset. He said that he was in the habit of experiencing increased abdominal discomfort each day as the day advanced, and that he occasionally had diarrhœa. Dr. Sinclair said that while the patient was undergoing a course of treatment by means of intramuscular injections of "Campolon" over a period of eight weeks, the abdominal pain and the other symptoms had decreased.

Dr. Sinclair's second patient was a man, aged thirty-one years, who had had pulmonary tuberculosis giving rise to symptoms early in 1934. In November, 1935, he had had a spontaneous pneumothorax with effusion on the left side; a purulent abscess had formed and had discharged later. In August, 1936, left phrenectomy was carried out and the abscess was treated by continuous suction. A year later thoracoplasty in three stages was performed. Signs of amyloid degeneration had commenced in December, 1937, with dyspepsia and diarrhœa. By May, 1938, the patient still had nausea, diarrhœa and vomiting, and the liver was enlarged down to the right iliac fossa; albuminuria was occasionally present, but the spleen was not demonstrably enlarged. In August, 1939, a bismuth and opium mixture was constantly required to palliate troublesome diarrhœa and indigestion; the patient was somewhat anæmic and never felt well; the urine regularly contained albumin. Dr. Sinclair said that for six months five cubic centimetres of "Campolon" had been injected intramuscularly every three weeks, but there had been no appreciable subjective or objective improvement.

### Parkinson's Disease.

Dr. Sinclair also showed a series of four middle-aged men and women who were undergoing treatment for Parkinson's disease, to demonstrate the improvement obtainable by the regular administration of tincture of atropine, between 30 and 45 minims a day.

### Radiology.

DR. ALAN MACKAY showed a large series of skiagrams to illustrate the radiological features of importance in the differential diagnosis of lesions in the osseous system.

### Pathology of Tuberculosis.

DR. G. M. OXER showed a number of pathological specimens illustrating the varied lesions of tuberculosis. In one series the varieties of scarring in healed apical lesions could be followed. Dr. Oxer said that many of the patients had no other signs of long-standing tuberculosis. He said that he had found the scars in 73 instances out of 100 consecutive autopsy examinations; 14 of the remaining subjects had suffered from active pulmonary phthisis, and extensive adhesions were found which obscured the apices. Dr. Oxer also showed a specimen of the lungs after thoracoplasty, plaster casts of the thorax after that operation, a series of eleven ribs removed from a patient who recovered from the operation, and skiagrams of a patient who had undergone thoracoplasty.

Amyloid disease was demonstrated from another group of specimens and sections. Dr. Oxer commented that the condition was not common, though during the past six months 15 examples had been found at autopsy at the hospital, and in several other instances early stages of the condition were seen but remained unproved.

Dr. Oxer also showed a series of specimens of lesions in the urinary tract, and several examples of various malignant conditions. He made a special feature of specimens and skiagrams from a case of hydatid disease of the pelvis. The patient had been under observation in several hospitals in Melbourne over a period of eighteen years, but had died without the correct diagnosis having been made.

### Treatment of Pulmonary Tuberculosis.

DR. A. M. HUTSON showed a series of patients to illustrate the results of thoracoplasty in the treatment of pulmonary tuberculosis. In a typical case a large cavity was present in the upper lobe of the right lung when the patient first came under observation in May, 1937. After some months of treatment in a sanatorium the patient's general condition had improved, but the cavity had increased in size. In January, 1938, right-sided artificial pneumothorax was induced, but was not satisfactory, on account of apical adhesions and excessive mobility of the mediastinum; later a large pleural hernia developed and the pneumothorax was abandoned. In May, 1938, the right phrenic nerve was divided and the diaphragm rose about three inches; this brought about a reduction in the size of the cavity, though it was then approximately four centimetres in diameter and the sputum contained tubercle bacilli. In October, 1938, partial thoracoplasty was performed in two places involving the upper seven ribs. The collapse of the chest obtained by that means was regarded as very satisfactory, and the patient's symptoms soon abated in severity. In November, 1939, the presence of the cavity could not be shown in a series of skiagrams, and the patient had gained approximately two stone in weight during the previous six months. An important feature indicative of improvement was the absence of sputum. The respiratory reserve was excellent, the shoulder girdle had a full range of movement and the chest was not deformed.

In the case of one patient shown by Dr. Hutson the empyema cavity resulting from a chronic mixed infection of tuberculous and pyogenic organisms had been closed successfully by the thoracoplasty procedure.

DR. T. H. STEEL showed two patients to illustrate the complications which had necessitated abandonment of the treatment of pulmonary tuberculosis by artificial pneumothorax. In one instance the pneumothorax had been complicated by the development of a purulent effusion from which tubercle bacilli had been obtained by culture on Petragnani's medium. Despite the presence of the effusion the patient had remained afebrile and had made steady general improvement in health. In the second case the presence of pleural adhesions and undue mobility of the mediastinum had rendered the collapse unsatisfactory. Dr. Steel demonstrated the excessive mediastinal mobility from skiagrams and indicated the evidences of unfavourable effect on the cavity. He added that attempts at pneumothorax had been abandoned and phrenic section had been carried out.

Dr. Steel also showed two patients with tuberculous empyemata who were undergoing treatment by means of artificial pneumothorax. He explained the method of obtaining continuous high pressure suction drainage of the cavity and showed the apparatus which was used for that purpose at the Austin Hospital. He remarked that the essential feature of the method was the incorporation of a five-gallon drum in the system; by that means the pressure could be easily stabilized and the system needed very little attention from day to day.

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A MEETING of the New South Wales Branch of the British Medical Association was held on April 18, 1940, at the Royal Alexandra Hospital for Children. The meeting took the form of a number of clinical demonstrations by members of the honorary staff of the hospital.

### Hydatid Cysts of the Lungs.

DR. S. G. BRADFIELD showed a girl, aged three years and eleven months, who, while recovering from pneumonia in a country hospital, was found on X-ray examination to have very large rounded masses in the lungs, two masses in the right lung and one in the left. She was sent to the Royal Alexandra Hospital for Children for confirmation of the provisional diagnosis of bilateral congenital cystic disease of the lungs. There was no reaction to the Casoni test, and the complement fixation test did not indicate the presence of hydatid disease. A leucocyte count disclosed the presence of slight eosinophilia.

The child appeared well and had no respiratory embarrassment. Examination of the chest disclosed dulness in the left infraclavicular region, the left axillary region, the left infrascapular region, the outer part of the right infraclavicular region and the right axillary region. The breath sounds were diminished over these areas and were accompanied by an occasional râle in the left axillary region; the breathing was otherwise harsh vesicular in type. Examination of the other systems revealed no abnormality. An X-ray examination revealed large circular and oval opacities on both sides, simulating hydatid cysts. However, in view of the patient's history and of the results of the tests that had been performed, the radiologist considered that the opacities were probably caused by encapsulated effusions following an inflammatory lesion, and suggested the performance of acupuncture. In spite of this report a provisional diagnosis of hydatid disease was made, thoracotomy was advised, and Dr. J. S. Davis removed a large hydatid cyst from the left lung.

### Malnutrition and Vitamin Deficiency.

Dr. Bradfield also showed a boy, aged four years, who was a "Far West" child. The history given by his local medical attendant was as follows. The child had never made much headway since the age of one year, and had been under observation for some years. He had always been underweight and of a "cross" disposition, suffering from chronic diarrhœa with blood-stained motions. Nine months previously he had been a patient in his local hospital for six months; on admission to hospital he weighed seventeen pounds, and on his discharge from hospital he weighed twenty-four pounds and there appeared to be little wrong with him. After a few days at home the diarrhœa returned. At the age of six months he had had erysipelas following a burn on the leg. This affected the whole of his body, from the feet to the point of the shoulder blade. Later, abscesses were found on the calf of the leg.

Dr. Bradfield said that on examination the child was about the size of a child aged eighteen months. He was happy and smiling. There were old scars on the forehead and scarring and retraction of the anterior nares, although no history of the cause was forthcoming. The skin on the trunk was rough and dry. Harrison's sulcus was present. Percussion and auscultation revealed no abnormality in the lungs. No abnormality was detected in the heart or the central nervous system. Examination of the abdomen revealed that the liver was hard, and the

edge was just palpable. The tonsils were present and the tongue was moist and clean. There were no other abnormal findings, and no worms were detected in the stools after santonin had been given.

An X-ray examination of the long bones made on March 30, 1940, gave the following information. There was some flaring, suggestive of old rickets, but no evidence of present rickets. The ends of the diaphyses were slightly transradiant, and this was thought to be due to the presence of slight scurvy.

Several pathological investigations were carried out. The blood failed to react to the Wassermann test. A blood count revealed a numerical red cell deficiency with eosinophilia. The fæces were examined for their fat content. The stool was pale and semi-solid, bulky and offensive. When it was examined microscopically, soap plaques were very numerous, but no other abnormality was found. The total fat content was 32% of the dried fæces; 8% of the total fat was unsplit fat, and 92% of the total fat was split fat. The report on this test was that the total fat content was not increased and there was evidence of normal pancreatic function. A "Redoxon" test was carried out; 100 milligrammes of "Redoxon" were given every day for six days before any was excreted in the urine.

Dr. Bradfield said that the child's smallness and emaciation were attributed only to malnutrition and vitamin deficiency.

### Abdominal Tuberculosis.

Dr. Bradfield then showed a child, aged two years, who had been admitted to the hospital on March 28, 1940, with a history of vomiting and diarrhœa of one week's duration. The motions were green, but no blood was present, and the child had been very feverish. The abdomen had been distended since the child had had measles twelve months previously, and there was a history of a cervical abscess three months prior to the meeting.

On examination the child was seen to be thin, pale and ill-looking, and the abdomen was distended. Examination of the abdomen by palpation could not be satisfactorily carried out because of tenseness and voluntary muscle guarding. The temperature was 101° F., the pulse rate was 128 per minute and the respirations numbered 32 per minute. Examination of the chest revealed slight dulness and bronchial breathing at the base of the left lung, but no other abnormality. The throat was not inflamed, the tongue was coated and moist, and both tympanic membranes were slightly injected.

On the child's admission to hospital the stools were green and relaxed and contained mucus; this condition was rapidly improved by the administration of 10% glucose solution and grated apple. The child had only one motion on the second day, and by the fifth day in hospital he was taking a light diet. On April 1, 1940, the abdomen was more distended and tense, and dulness extended upwards to just above the umbilicus. An indefinite mass was palpated on the left side. By April 6 the abdominal distension had been relieved by a daily enema and the mass was more easily palpable; it was hard, being most prominent in the left hypochondrium and less distinct in the lower part of the abdomen. Some dulness was then noticed at the base of the right lung. Dr. Bradfield said that the signs had remained unchanged since that time, but the patient was losing weight.

Several pathological tests were made. Cultures were made from the stools, and all the colonies were found to ferment lactose. The fat content of the stools was estimated on April 5. The stool was pale and pasty, and microscopic examination revealed an increased amount of soap, but no other abnormality. The total fat content of the dried fæces was 41%; 2% of the total fat was unsplit fat and 98% was split fat. The total fat content was reported as being slightly increased, but the splitting was normal. A blood count revealed the presence of microcytic hypochromic anæmia. The Mantoux test elicited a positive reaction.

An X-ray examination revealed no definite lesion in the abdomen; but some haziness suggesting fluid was noted. Some congestion of the bases of both lungs was found radiologically, but no evidence of tuberculosis.

### Myxoma of the Vagina.

DR. J. SHEDDEN DAVIS showed a female infant, aged ten months, with a large, soft, fleshy mass protruding from the vagina. The tumour was growing from the posterior vaginal wall just inside the hymen. The growth had been excised five months previously, and subsequently deep X-ray therapy was given; but the tumour recurred three months later and was again removed by diathermy. Within a fortnight it again reached its previous size. Histologically the growth was found to be myxomatous, with many nævus cells and no evidence of sarcoma.

DR. P. L. HIPSLEY showed a female child, aged two years, who had been admitted to hospital on May 20, 1939; she was stated to be suffering from "dropping down of the uterus since yesterday".

On examination several papillomatous masses were seen to protrude from the vagina, and on May 23 numerous grape-like masses were removed with diathermy. The pathologist reported that the masses consisted of connective tissue of a primitive type and were covered with normal squamous epithelium.

On August 29 the grape-like masses had recurred, and at operation they appeared to be growing from the anterior and lateral walls of the vagina. Pathological examination showed that the masses consisted of mycoid tissue with a variable permeation of vascularized connective tissue. The epithelium covering the mycoid tissue was intact and had the usual squamous structure.

On October 1, 1939, the polypoid masses had recurred. A course of eight exposures to deep X rays produced some measurable reduction in the size of the growth.

On January 25, 1940, the growth had recurred and was removed by diathermy. On March 14 it had recurred again, and was about the size of a goose egg. Another course of deep X-ray therapy effected a reduction in the size of the growth.

### Hydrocephalus Successfully Treated by Puncture of the Lamina Terminalis.

Dr. Shedden Davis also showed a boy, aged six years, who had suffered from measles in July, 1939. Three weeks after his discharge from hospital in Canberra he was readmitted on account of unexplained vomiting, and he remained in hospital for a further three weeks. Six weeks prior to his admission to the Royal Alexandra Hospital for Children, on December 30, 1939, internal squint developed. He was still vomiting occasionally, and his parents noticed that his sight was deteriorating, his left eye being practically blind. An X-ray examination of the skull, made in the country, suggested some abnormality in the pituitary region.

On his admission to hospital examination of the nervous system gave the following information. His gait was ataxic, but not characteristic. Motor power was impaired in the lower limbs, which were hypotonic. Sensation was normal. The knee jerks were absent, but all other reflexes were present. The speech was slurred. With the left eye the patient could distinguish light only; the vision of the right eye was almost normal. There was slight internal strabismus of the left eye, but no paresis. The boy had papillœdema to almost eight diopters in each eye, and macular stars were present. Examination of the heart, chest, abdomen and throat revealed no abnormality.

The boy was transferred from the care of Dr. N. M. Gregg to that of Dr. Shedden Davis. The sight in his right eye grew rapidly worse, until he could just count fingers, and, as the papillœdema was steadily increasing, ventriculography was performed on January 11. This revealed gross internal hydrocephalus, which appeared to be due to a block just outside the apertures of the fourth ventricle, for no air could be made to enter the basal cisterns. Separation of the cranial sutures was also found. The hydrocephalus was attributed to adhesions following basal meningitis. Using "Sodium Amytal" and ether anæsthesia, Dr. Davis performed suboccipital crani-

otomy and separated some adhesions at the base of the brain. This operation was performed on January 17. The child's condition did not improve, the papillœdema remained unaltered, and he vomited occasionally; moreover, the wound had become infected and a slough was separating.

On February 7 Dr. Davis performed the first stage of fronto-parietal craniotomy, using "Sodium Amytal" and ether anæsthesia. A fronto-parietal flap of bone was raised on the left side, the dura was opened and the flap was replaced. On February 9 the second stage of the operation was performed under similar anæsthesia. The left fronto-parietal flap was again raised, the dura was opened, the left frontal lobe of the brain was lifted up, and an opening was made into the floor of the third ventricle. Cerebro-spinal fluid escaped. Ventricular puncture had been performed as a preliminary.

The wound in the occipital region had become severely infected; it had an undermined irregular edge, and the infection was steadily spreading. This was treated with zinc peroxide paste, the dressings being changed every three days.

Dr. Davis said that the boy's condition had steadily improved since the operation, the wound had slowly healed, and the papillœdema had considerably decreased. The sight in both eyes had progressively improved, until at the time of the meeting he could look at picture books, although he appeared to have blind spots. He was bright and well and able to walk, and did not seem mentally retarded.

### Measles, Tuberculous Glands in the Neck, Subacute Miliary Tuberculosis and Acute Mastoiditis.

Dr. Davis then showed a female child, aged seventeen months, who had been admitted to hospital on October 5, 1939, with a history of vomiting, constipation and irritability of nine days' duration; she had had two convulsions per day, and the light had hurt her eyes for the previous few days.

On examination the child was seen to be irritable and suffering from photophobia, but no other abnormality was detected. The following day the measles rash developed; the child was very ill; she vomited and was dehydrated, and on October 15 she passed bright blood *per rectum*. She was given six ounces of saline solution intraperitoneally. About two weeks later a swelling developed on the left side of her neck; this gradually became soft and fluctuant, and the condition was diagnosed as cervical adenitis. On November 2 the abscess was opened, pus was found and a gauze wick was inserted. A discharging sinus persisted on the left side and a similar sinus developed on the right side; this was incised and the pus was examined for tubercle bacilli. These were found. The Mantoux test elicited a strongly positive reaction with human and bovine old tuberculin.

The child continued to suffer from anorexia, persistent sinuses on both sides of the neck and poor general condition. An X-ray examination of the thorax was made on December 8; this revealed considerable enlargement of the right hilar shadow and an increase in the lung markings, especially on the right side. The appearances were typically tuberculous.

The child continued to make slow progress and to gain in weight. The tuberculous sinuses in the neck produced a profuse discharge; several more abscesses formed and were opened in the next month. These were dressed with castor oil and balsam of Peru, and their condition improved rapidly. Early in January a discharge from her left ear began; this was treated with drops.

A second X-ray examination was made on January 11, 1940. This revealed localized miliary tuberculosis in the right lung and to a less extent in the left lung. Her general condition steadily improved and the sinuses in her neck were gradually clearing up; but her temperature remained slightly and irregularly elevated. Her weight was normal for her age.

A further X-ray examination in March revealed a great increase in the tuberculous markings in the lungs, in spite of clinical improvement. On April 14 a swelling developed behind her left ear, from which pus was still being discharged, and on April 16 simple mastoidectomy was performed. Dr. Davis said that the latest X-ray examination of the chest had revealed pronounced improvement; the sinus on the left side of the neck had almost healed and that on the right side had completely healed. The child was clinically very well.

### Influenzal Meningitis with Recovery.

DR. LINDSAY DEY showed a boy, aged three years, who had been in the hospital five months previously suffering from influenzal meningitis. The illness had begun suddenly one day before his admission to hospital with vomiting, extreme restlessness and coarse twitching of the face and of the whole of the body. Neck rigidity and general hyperæsthesia were present; Kernig's sign was elicited. Lumbar puncture was performed; the cerebro-spinal fluid was thick and turbid and contained much fibrin; 64% of the cells were neutrophile and 16% were mononuclear; the protein content of the fluid was estimated at more than 400 milligrammes per 100 cubic centimetres and the chloride content at 670 milligrammes per 100 cubic centimetres. No sugar was present. *Hæmophilus influenzæ* was grown on culture from the cerebro-spinal fluid.

Dr. Dey said that treatment with very large doses of "M & B 693" had been begun from the earliest moment; two tablets (one gramme) were given every four hours for five days, one tablet (0·5 gramme) was given every four hours for eleven days, and half a tablet (0·25 gramme) was given every four hours for three days. Lumbar puncture was performed every day for the first fourteen days, and again on the sixteenth and twenty-third days. A total of 54 cubic centimetres of anti-influenzal serum was given in six days by the intrathecal route, and in addition 39 cubic centimetres were given in three days by intramuscular injection. After three and a half days of treatment the cerebro-spinal fluid was sterile, and on the twenty-third day it still contained leucocytes. The boy appeared to have made a complete recovery.

Dr. Dey remarked that since the introduction of treatment by "M & B 693" four out of eight patients suffering from influenzal meningitis had recovered. Previously, when "Prontosil" was used, five patients had recovered out of sixteen treated at the Royal Alexandra Hospital for Children.

### Chronic Hæmolytic Anæmia.

Dr. Dey also showed a female patient, aged six years, who had been admitted to the hospital after suffering for three days from sore throat, fever, vomiting and pain in the abdomen. The child had always been pale. On her admission to hospital the spleen was found to be enlarged and scattered bruises were present. The erythrocytes numbered only 1,700,000 per cubic millimetre; some of the cells were immature and 14% were reticulocytes; their fragility was normal. Urobilinuria was present, but not hyperbilirubinæmia. A provisional diagnosis of chronic hæmolytic anæmia was made. A blood transfusion of six ounces was given, followed by a transfusion of a similar amount a few days later. Five hours after the second transfusion hæmoglobinuria was noted. On investigation it was found that the blood of the first donor was incompatible with that of the second, although the blood of each was compatible with that of the child.

### Cœliac Disease.

Dr. Dey also showed a child suffering from cœliac disease. He said that the patient's weight had fluctuated until "Campolon" was exhibited, in doses of two cubic centimetres every third day. Since then the weight had steadily increased.

### Lipoid Nephrosis.

DR. R. A. R. GREEN showed a boy, aged two and a half years, who had been admitted to hospital on March 11, 1940, with a history of vomiting, intermittent swelling of the extremities and scanty urine, of two months' duration. On examination the child was seen to be small and pale.

Obvious but slight swelling of the subcutaneous tissue of the face and upper extremities was present, and there was sufficient œdema of the feet to cause pitting on pressure. There was no œdema of the abdominal or thoracic parietes. The tonsils were much enlarged. No abnormality was detected in the heart or lungs. The systolic blood pressure was 80 and the diastolic pressure was 50 millimetres of mercury. Examination of the urine revealed a heavy cloud of albumin. The urine contained a trace of glucose, and a culture yielded a growth of *Bacillus coli communis*. The urea content of the blood was 25 milligrammes per 100 cubic centimetres; the creatinine content was 2·9 milligrammes and the cholesterol content was 268 milligrammes, both per 100 cubic centimetres. A blood count gave the following information. The erythrocytes numbered 4,120,000 per cubic millimetre and the hæmoglobin value was 75% (Sahli). The leucocytes numbered 11,200 per cubic millimetre; 46% were polymorphonuclear cells, 43% were lymphocytes, 7% were monocytes and 4% were eosinophile cells.

On March 12 the child's abdomen was very full in the flanks and shifting dulness was elicited. On March 29 microscopic examination of the urine revealed some albumin and an occasional red blood cell. On April 1 slightly more œdema was present, and on April 2 still further œdema was present and the child had German measles. The urine contained a great deal of albumin. On April 5 the child's temperature was normal, the œdema had diminished and the urine contained slightly less albumin. By April 10 very slight œdema was present, but the same amount of albumin was present in the urine.

*(To be continued.)*

# Post-Graduate Work.

## A COURSE IN MILITARY MEDICINE AND SURGERY.

THE New South Wales Post-Graduate Committee in Medicine has arranged a course of lectures, primarily for medical officers of the Australian Imperial Force, but also for medical officers of the Navy, the Air Force and the militia. The course is open to all medical men. No fee is payable and registration is unnecessary. All lectures will be given at the Stawell Lecture Hall, 145, Macquarie Street, Sydney.

The programme is as follows:

**Monday, May 27.**

4 p.m.—"Typhoid and Paratyphoid and Food Infection": Dr. W. C. Sawers.
"Amœbiasis": Dr. G. A. M. Heydon.
"Schistosomiasis": Dr. G. A. M. Heydon.

**Tuesday, May 28.**

4 to 4.45 p.m.—"Venereal Diseases": Dr. J. Cooper Booth.
4.45 to 5.30 p.m.—"Skin Infections": Dr. A. L. Dawson.
5.30 to 6 p.m.—"Control of Scabies and Lice": Professor Harvey Sutton.

**Wednesday, May 29.**

4 p.m.—"Malaria and Blackwater Fever": Dr. A. H. Baldwin.
"Leptospirosis and Smallpox": Dr. W. C. Sawers.

**Thursday, May 30.**

4 p.m.—"War Neuroses": Professor W. S. Dawson.
5 p.m.—"Cardiac Neuroses and Trauma": Dr. S. A. Smith.

**Friday, May 31.**

4 p.m.—"Dysentery": Dr. E. Ford.
"Plague": Dr. W. C. Sawers.
"Control of Malaria and Mosquitoes": Dr. A. H. Baldwin.

**Monday, June 3.**

4 p.m.—"Water Purification": Dr. A. H. Baldwin.
"Endemic Typhus and Trench Fever": Dr. W. C. Sawers.

**Tuesday, June 4.**

4 p.m.—"Tetanus and Gas Gangrene": Professor Harold Dew.
5 p.m.—"Treatment of Shock": Dr. V. M. Coppleson.

**Wednesday, June 5.**

4 p.m.—"Personal Hygiene, Fatigue and Chilling": Professor Harvey Sutton.
"Excreta Disposal": Dr. A. H. Baldwin.
"Disposal of Urine, Kitchen Waste and Manure": Dr. A. H. Baldwin.

**Thursday, June 6.**

4 p.m.—"Surgery of the Large Blood Vessels": Dr. J. C. Storey.
5 p.m.—"Injuries to Joints": Dr. J. Hoets.

**Friday, June 7.**

4 p.m.—"Army Ration, Food Constituents, Food Requirements, Disease Transmitted through Food": Professor Harvey Sutton.
"Heat Hyperpyrexia and Exhaustion": Dr. A. H. Baldwin.
"Oriental Sore and Tropical Ulcer": Dr. A. H. Baldwin.

**Monday, June 10.**

4 p.m.—"Compound Fractures": Dr. Wilfred Vickers.
"Amputations": Dr. Wilfred Vickers.

**Tuesday, June 11.**

4 p.m.—"Head Injuries": Dr. H. R. G. Poate.
5 p.m.—"Urogenital Surgery in War": Dr. R. H. Bridge.

**Wednesday, June 12.**

4 p.m.—"Injuries of the Chest and Abdomen": Dr. George Bell.
5 p.m.—"The Sulphanilamides": Dr. S. A. Smith.

Special demonstrations in anæsthesia, application of plaster, blood transfusion and typing will be arranged at the Prince Henry Hospital. These demonstrations will be limited to medical officers of the Australian Imperial Force.

## ANNUAL REFRESHER COURSE IN BRISBANE.

THE Queensland Post-Graduate Committee announces that the annual refresher course will be held at Brisbane from May 31 to June 7, 1940. The programme is as follows.

**May 31 to June 7, 1940.**

If members intending to join the course would indicate their desires, for example, the use of plaster casts *et cetera*, individual demonstrations will be arranged for them. Courses in clinical pathology will be arranged on application to the Director of the hospital laboratory.

**Friday, May 31, 1940.**

4.30 to 5.30 p.m.—"Blood and Plasma Transfusion and Intravenous Drip Method", by Professor J. V. Duhig and Dr. Alan Lee, Dr. Milton Geaney, and Dr. F. W. Arden, at the theatre, Brisbane General Hospital.
8.30 p.m.—Films, to be shown at the Medical School.

**Saturday, June 1, 1940.**

9.30 to 10.30 a.m.—Pathological demonstrations, at the Medical School.

11 a.m. to 12 noon.—Demonstration of X-ray films, at the Brisbane General Hospital.

2.30 to 5 p.m.—Clinical meeting, at the Mater Misericordiæ Hospital.

8.15 p.m.—Lecturettes:

1. "Surgical Treatment of Vascular Hypertension", Dr. Alan Lee.
2. "Cutting the Drug Bill", Dr. S. F. McDonald.
3. "Injuries to the Rectum", Dr. G. H. Brandis.
4. "Birth Palsy", Dr. A. V. Meehan.

**Sunday, June 2, 1940.**

10 a.m. to 12.30 p.m.—Clinical meeting, at the Brisbane General Hospital.

5 p.m.—Members of the course and their wives are invited to be present at an at home to be given by the President of the British Medical Association (Queensland Branch), Dr. Charles Wassell, and Mrs. Charles Wassell, at their residence, 20, Oxlade Drive, New Farm.

**Monday, June 3, 1940.**

10 a.m.—Dr. G. C. H. Hogg: Demonstration of post-operative treatment, including indwelling gastric tubes, at the Brisbane General Hospital.

2 p.m.—Demonstration: Methods of infant feeding, Valley Baby Clinic. Each demonstration is limited to four members.

4 p.m.—Dr. Fay Maclure: "Another Angle on Fractures", at the Medical School.

8.15 p.m.—Dr. Cotter Harvey: "Thoracic Surgery from the Physician's Standpoint", at the Medical School.

**Tuesday, June 4, 1940.**

2 p.m.—Demonstration: Methods of infant feeding, Valley Baby Clinic. Each demonstration is limited to four members.

4 p.m.—Dr. Cotter Harvey: Clinical demonstration, diseases of the lungs, at the Brisbane General Hospital, Students' Lecture Theatre.

8.15 p.m.—Mr. Fay Maclure: "The Management of War Wounds of the Face", at the Medical School.

**Wednesday, June 5, 1940.**

9 a.m.—Inspection of the hospital.

10 a.m.—(1) Film demonstration: "Application of Physiotherapy to Obstetrical Practice"; (2) "Endocrine Therapy in Obstetrical Practice", by Professor G. Shedden Adam and staff, at the Brisbane Women's Hospital.

2.30 to 4.30 p.m.—Conference of the Council of the Queensland Branch of the British Medical Association with delegates from the Local Medical Associations, at B.M.A. House, 225, Wickham Terrace, Brisbane.

8.30 p.m.—Dance and bridge party, to be held at the Belle Vue Hotel.

**Thursday, June 6, 1940.**

4 p.m.—Dr. Fay Maclure: "Mechanical Principles in the Causation and Treatment of Disease".

8.15 p.m.—Dr. E. Weston Hurst: "The Various Forms of Encephalomyelitis and Meningitis, with Special Reference to those caused by Viruses", at the Medical School.

**Friday, June 7, 1940.**

4 to 5.30 p.m.—Dr. Cotter Harvey: "Tuberculosis as a Problem for the State", at the Medical School.

8.30 p.m.—Dr. E. Weston Hurst: "Influenza and other Respiratory Infections due to Viruses", the Joseph Bancroft Memorial Lecture, at the Medical School.

The subscription for the course is £2 2s., which includes a double ticket for the dance and bridge party, to be held at the Belle Vue Hotel, on Wednesday, June 5, 1940, at 8.30 p.m. Extra tickets for this entertainment may be obtained at a cost of 7s. 6d. each. The fee is payable in advance to the Honorary Secretary, Dr. Norman Sherwood, B.M.A. House, 225, Wickham Terrace, Brisbane. Cheques should be endorsed "Post-Graduate Course".

# Naval, Military and Air Force.

## APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 80, of May 2, 1940.

### AUSTRALIAN MILITARY FORCES.

NORTHERN COMMAND.

**First Military District.**

*Australian Army Medical Corps.*

Honorary Captain J. L. Groom is appointed from the Reserve of Officers (A.A.M.C.), and to be Captain (provisionally), 27th February, 1940.

*Australian Army Medical Corps Reserve.*

*To be Honorary Captains*—William Edward Hasker, Colin Campbell Wark, Cosmo David Jermyn, William James Chapman, Robert Malcolm Murray, John Edward Rea Clarke and Reginald Hannam Henderson Walker, 11th April, 1940.

EASTERN COMMAND.

**Second Military District.**

*Australian Army Medical Corps.*

*To be Captains (provisionally) supernumerary to establishment pending absorption*—William Chalfont Holley and Wallace Freeborn, 15th March, 1940, and 27th March, 1940, respectively. Major D. R. Brown is appointed from the Reserve of Officers (A.A.M.C.), with regimental seniority next after Major K. S. Richardson, 1st April, 1940.

*Australian Army Medical Corps Reserve.*

*To be Honorary Captain*—William Roy Wilson, 10th April, 1940.

SOUTHERN COMMAND.

**Third Military District.**

*Australian Army Medical Corps.*

*To be Temporary Lieutenant-Colonels*—Majors H. F. Summons, J. G. Hayden, W. H. Ward and R. H. Small, E.D., 1st February, 1940. Captain (provisionally) G. C. McKechnie is transferred to the Reserve of Officers (A.A.M.C.) and to be Honorary Captain, 19th April, 1940.

*Australian Army Medical Corps Reserve.*

*To be Honorary Captains*—Adrian Patrick Joubert Gorman, Allistair Hyland Grieve, William George Richmond Sullivan and Leslie Gordon Cato, 4th April, 1940.

**Fourth Military District.**

*Australian Army Medical Corps Reserve.*

*To be Honorary Captain*—Gordon McLeod Turnbull, 11th March, 1940.

**Sixth Military District.**

*Australian Army Medical Corps.*

*To be Captain (provisionally)*—Reginald Albert Lewis, 1st May, 1939. (In lieu of notification respecting this officer which appeared in Executive Minute No. 153/1939, promulgated in *Commonwealth Gazette* No. 32 of 18th May, 1939.)

WESTERN COMMAND.

**Fifth Military District.**

*Australian Army Medical Corps.*

Honorary Major G. R. Troup is appointed from the Reserve of Officers (A.A.M.C.), and to be Captain (provisionally), 4th April, 1940.

*Australian Army Medical Corps Reserve.*

*To be Honorary Captain*—Francis Gordon Stimson, 2nd April, 1940. Honorary Lieutenant H. O. Howling is retired.

# Correspondence.

## SYPHILIS AND NEUROSYPHILIS TREATED BY ELECTROPYREXIA.

SIR: In THE MEDICAL JOURNAL OF AUSTRALIA of June 12, 1937, you published a paper "Syphilis and Neurosyphilis Treated by Electropyrexia". *Inter alia*, it contained records of eight patients with early syphilis treated by inductothermy and chemotherapy. I am now able to show the serological reactions of these patients between three and four years after treatment; they have received no further treatment in the meantime. From the table it will be seen that five of the eight patients remain entirely free from any evidence of their infection. In one case there is an indefinite reaction, and in two there is a fully positive reaction. Although heat alone (by heat is meant a temperature above 103·5° F.) will not change a positive reaction to the Wassermann test to an absence of reaction, it is worthy of note that only a small amount of drugs was given in addition to the heat to bring about this change. In Cases 40 and 62 only two injections of "Kharsulphan" were given, and in Case 61 three injections were given. It will also be seen that in those cases in which a positive reaction is now obtained, only a minimum of treatment was given, in respect to both heat and drugs. In Cases 60 and 67, in which originally more prolonged treatment was required to cause the reactions to disappear, there is still an absence of reaction. Eight patients suffering from congenital syphilis were treated by the same methods; both the blood and the cerebrospinal fluid of four of them, at the conclusion of the treatment, failed to react to the Wassermann test. It has been possible to trace only one of these patients; his blood still fails to yield a reaction after three and a half years. Patients with congenital syphilis required much more intensive treatment than those with an early infection. These results suggest, if they do not prove, that early syphilis can be cured in from a few weeks to twelve months of treatment with pyrexia and chemotherapy.

Yours, etc.,

GUY P. U. PRIOR.

Bay View Hospital,
Tempe,
New South Wales.
March 27, 1940.

| Case. | Type. | Date. | Blood. | | | Treatment. |
|---|---|---|---|---|---|---|
| | | | Wassermann. | Kline. | Boas. | |
| 58 | Primary and secondary. | Before treatment January, 1936 .. | +[1] | ++++ | + | Heat for 49 hours. Two injections of "Kharsulphan". Total treatment, 29 days. |
| | | After treatment March, 1936 .. | − | − | − | |
| | | August, 1939 .. .. .. | + | +++ | + | |
| 61 | Primary and secondary. | Before treatment January, 1936 .. | + | ++++ | + | Heat for 45½ hours. Three injections of "Kharsulphan". Total treatment, 31 days. |
| | | After treatment May, 1936 .. | − | ++ | − | |
| | | August, 1939 .. .. .. | − | − | − | |
| 56 | Secondary. | Before treatment January, 1936 .. | + | ++++ | + | Heat for 60 hours. Two injections of "Kharsulphan". Total treatment, 49 days. |
| | | After treatment April, 1936 .. | − | − | − | |
| | | August, 1939 .. .. .. | − | − | − | |
| 57 | Secondary. | Before treatment January, 1936 .. | + | ++++ | + | Heat for 38½ hours. Four injections of "Kharsulphan". Total treatment, 44 days. |
| | | After treatment March, 1936 .. | − | − | − | |
| | | August, 1939 .. .. .. | − | + | Indefinite − | |
| 62 | Primary. | Before treatment February, 1936.. | + | ++++ | + | Heat for 35½ hours. Two injections of "Kharsulphan". Total treatment, 23 days. |
| | | After treatment May, 1936 .. | − | − | − | |
| | | August, 1939 .. .. .. | + | +++ | + | |
| 40 | Primary. | Before treatment June, 1936 .. | + | ++++ | + | Heat for 28 hours. Two injections of "Kharsulphan". Total treatment, 28 days. |
| | | After treatment October, 1936 .. | − | − | − | |
| | | August, 1939 .. .. .. | − | − | − | |
| 60 | Primary and secondary. | Before treatment March, 1936 .. | + | ++++ | + | Heat for 102½ hours. Eight injections of "Kharsulphan", nine of "Muthanol". Total treatment, 298 days. |
| | | After treatment December, 1936 .. | − | − | − | |
| | | August, 1939 .. .. .. | − | − | − | |
| 67 | Secondary. | Before treatment May, 1936 .. | Slightly + | ++ | + | Heat for 79 hours. Eleven injections of "Muthanol", eight of "Kharsulphan". |
| | | After treatment September, 1936.. | − | − | − | |
| | | August, 1939 .. .. .. | − | − | − | |

[1] + = positive reaction. − = no reaction.

## Obituary.

FRANCIS ALEXANDER NEWMAN.

WE regret to announce the death of Dr. Francis Alexander Newman, which occurred on May 4, 1940, at Melbourne, Victoria.

## Nominations and Elections.

THE undermentioned has applied for election as a member of the Victorian Branch of the British Medical Association:

Fox, Eric, M.D., 1936 (Bologna), c.o. Tesoriero Brothers, 268, Carlisle Street, St. Kilda.

The undermentioned has applied for election as a member of the Tasmanian Branch of the British Medical Association:

Lally, Desmond Francis, M.B., B.S., 1933 (Univ. Melbourne), Launceston Public Hospital, Launceston.

The undermentioned has applied for election as a member of the South Australian Branch of the British Medical Association:

Smith, Keith Viner, M.B., B.S., 1939 (Univ. Adelaide), Royal Adelaide Hospital, Adelaide.

The undermentioned have been elected members of the South Australian Branch of the British Medical Association:

Dunstone, J. L., M.B., B.S., 1939 (Univ. Adelaide), Royal Adelaide Hospital, Adelaide.

Wood, M. B., M.B., B.S., 1939 (Univ. Adelaide), Royal Adelaide Hospital, Adelaide.

## Diary for the Month.

MAY 21.—New South Wales Branch, B.M.A.: Ethics Committee.
MAY 22.—Victorian Branch, B.M.A.: Council.
MAY 23.—New South Wales Branch, B.M.A.: Clinical meeting.
MAY 24.—Queensland Branch, B.M.A.: Council meeting.
MAY 28.—New South Wales Branch, B.M.A.: Medical Politics Committee.
MAY 30.—South Australian Branch, B.M.A.: Branch—Listerian Oration.
MAY 30.—New South Wales Branch, B.M.A.: Branch.
MAY 31.—Tasmanian Branch, B.M.A.: Council.
JUNE 4.—New South Wales Branch, B.M.A.: Organization and Science Committee.
JUNE 5.—Western Australian Branch, B.M.A.: Council.
JUNE 5.—Victorian Branch, B.M.A.: Branch.
JUNE 6.—South Australian Branch, B.M.A.: Council.
JUNE 7.—Queensland Branch, B.M.A.: Branch—Joseph Bancroft Memorial Lecture.
JUNE 11.—Tasmanian Branch, B.M.A.: Branch.
JUNE 11.—New South Wales Branch, B.M.A.: Executive and Finance Committee.

## Medical Appointments Vacant, etc.

**For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser", pages xiii-xv.**

CHILDREN'S HOSPITAL, ORTHOPÆDIC SECTION, FRANKSTON, VICTORIA: Assistant Resident Medical Officer.
ROYAL HOSPITAL FOR WOMEN, PADDINGTON, NEW SOUTH WALES: Honorary Officers.
ST. GEORGE DISTRICT HOSPITAL, KOGARAH, NEW SOUTH WALES: Resident Medical Officers.

## Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

| BRANCHES. | APPOINTMENTS. |
|---|---|
| NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney. | Australian Natives' Association.<br>Ashfield and District United Friendly Societies' Dispensary.<br>Balmain United Friendly Societies' Dispensary.<br>Leichhardt and Petersham United Friendly Societies' Dispensary.<br>Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney.<br>North Sydney Friendly Societies' Dispensary Limited.<br>People's Prudential Assurance Company Limited.<br>Phœnix Mutual Provident Society. |
| VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne. | Associated Medical Services Limited.<br>All Institutes or Medical Dispensaries.<br>Australian Prudential Association, Proprietary, Limited.<br>Federated Mutual Medical Benefit Society.<br>Mutual National Provident Club.<br>National Provident Association.<br>Hospital or other appointments outside Victoria. |
| QUEENSLAND: Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17. | Brisbane Associate Friendly Societies' Medical Institute.<br>Proserpine District Hospital.<br>Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing. |
| SOUTH AUSTRALIAN: Secretary, 178, North Terrace, Adelaide. | All Lodge appointments in South Australia.<br>All Contract Practice Appointments in South Australia. |
| WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth. | Wiluna Hospital.<br>All Contract Practice Appointments in Western Australia. |

## Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such a notification is received within one month.

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## CHARGE AGAINST AUSTRALIAN.

Under this heading in The Sun on February 15 it was reported that one Andrew John Gibson, registered in his alleged real name of Henry Cecil Rutherford Darling as a medical practitioner of Sydney had been charged with unlawfully killing Gladys Ada Elizabeth Higginbotham.

The Sun wishes to make it clear that the Henry Cecil Rutherford Darling mentioned above is in no way identical or connected with Dr. Harry Cecil Rutherford Darling, of 229 Macquarie Street, Sydney, and expresses its regret for any false impression to the contrary that may have been conveyed by its report.

PROPRIETORS,
SUN NEWS-PICTORIAL.

## AUSTRALIAN "DOCTOR" ACCUSED OF KILLING

**Under the above heading in the issue of The Daily News, Perth of February 15 last it was reported that one "Dr" Gibson, in his alleged real name of Henry Darling, formerly of Sydney, was charged with unlawfully killing one, Mrs. Gladys Higginbotham, obtaining money under false pretences and issuing false death certificates.**

The Daily News wishes to make it quite clear that the Henry Darling above mentioned is in no way identical or connected with Dr. Harry Cecil Rutherford Darling, of 229 Macquarie-street, Sydney, and expresses its regret for any false impression to the contrary that may have been conveyed by its report.

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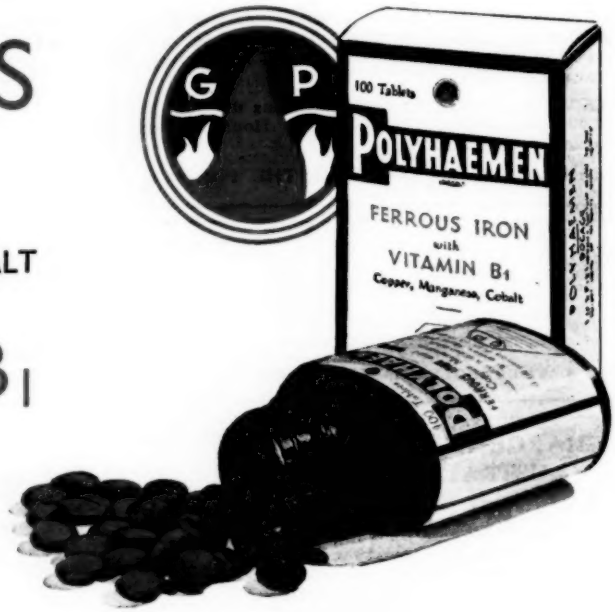


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